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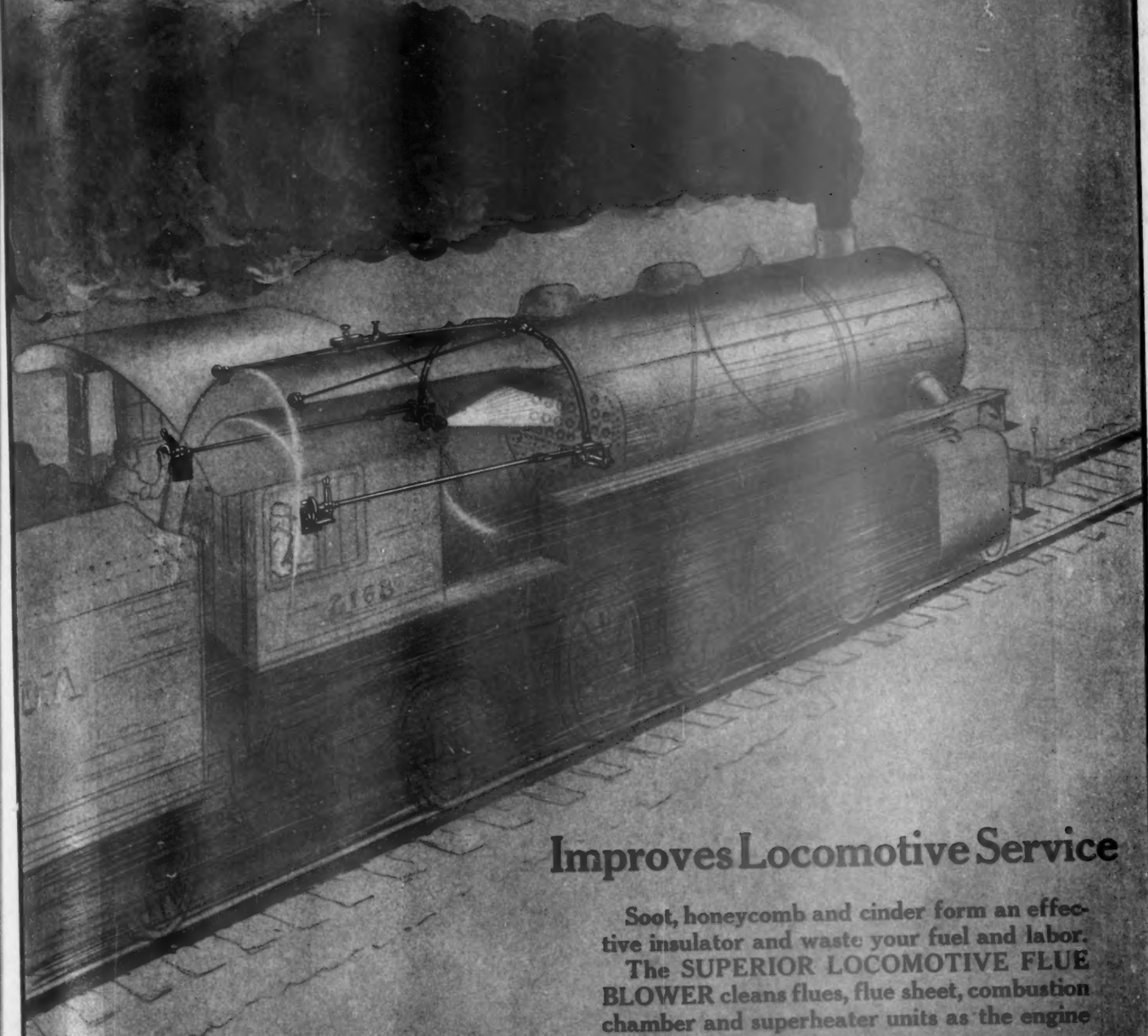
Railway Age

SECOND HALF OF 1923—No. 6 NEW YORK—AUGUST 11, 1923—CHICAGO SIXTY-EIGHTH YEAR



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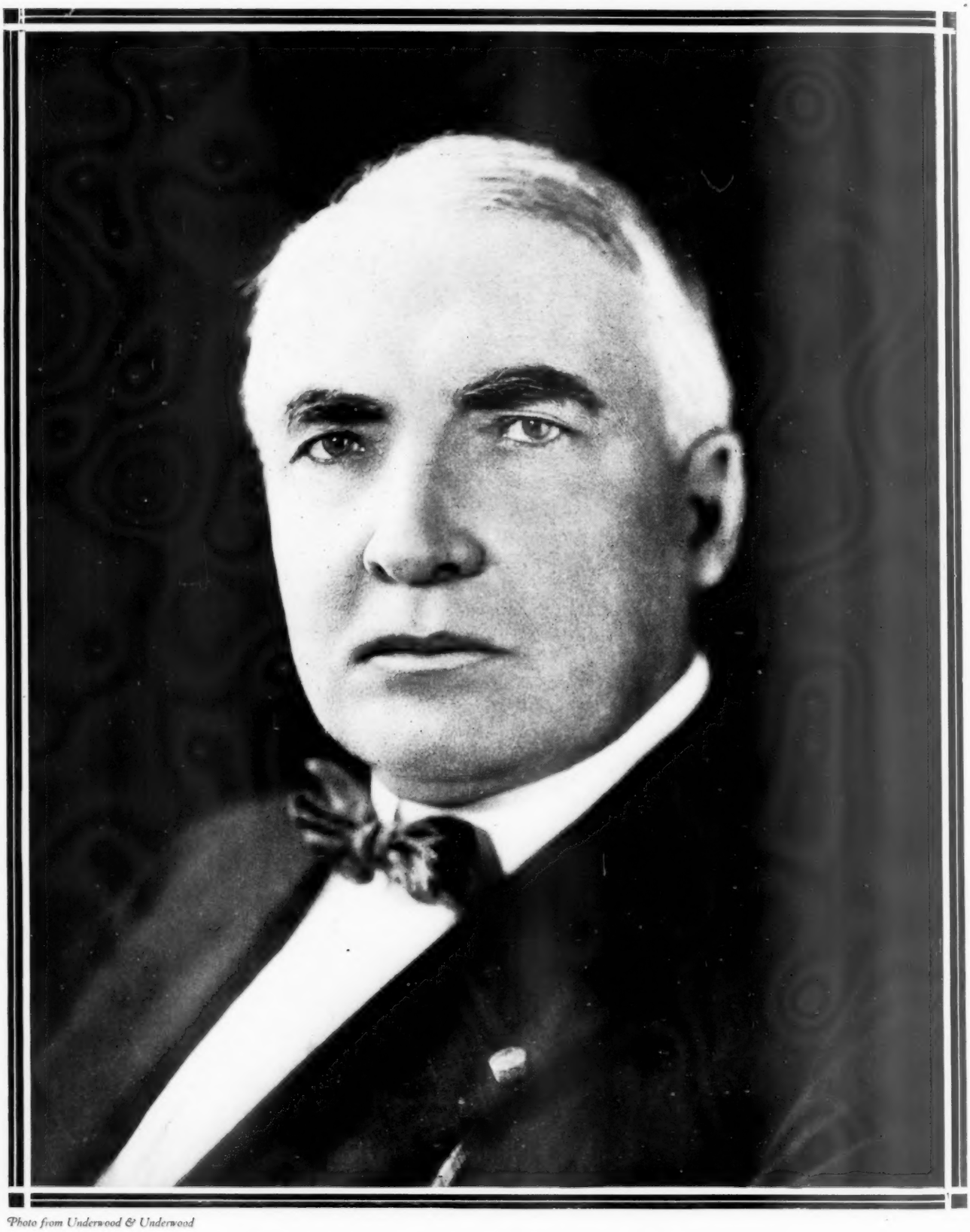


Photo from Underwood & Underwood

Warren Gamaliel Harding

Twenty-Ninth President of the United States

Born November 2, 1865—Died August 2, 1923

EDITORIAL

Railway Age

The Table of Contents Will Be Found on Page 5 of the Advertising Section

Warren Gamaliel Harding

IN THE DEATH of our beloved President, progress in transportation by rail and water has lost a staunch friend. While his activities were the more pronounced with the American merchant marine, nevertheless he had a keen perception of the relation between the railways and the prosperity of the country as a whole, and never lost an opportunity to contribute his best thoughts toward an intelligent solution of existing problems.

But it is the loss to the nation to which our thoughts turn at this time. The death of no man in public life could come nearer to being an individual loss to every red blooded American in the land. His personality was magnetic; and it was but natural that his sudden end should have shocked millions of his fellow citizens, who irrespective of politics loved him as a man.

It would be possible to fill page after page with anecdotes in the life of Warren Gamaliel Harding from which one could easily pick reflections of the golden threads of love and sympathy for his fellow beings that so endeared him to young and old alike; but many of them are summed up in the following quotation from his speech at Hoboken, New Jersey, on May 23, 1921, on the occasion of the return of 5,212 bodies of men who paid the supreme sacrifice during the world war: "No one may measure the vast and varied affections and sorrows centering on this priceless cargo of bodies—once living, fighting for, and finally dying for the Republic. One's words fail, his understanding is halted, his emotions are stirred beyond control when contemplating these thousands of beloved dead. I find a hundred thousand sorrows touching my heart, and there is ringing in my ears, like an admonition eternal, an insistent call, 'It must not be again! It must not be again!' "

The gentle soul has passed to the Great Beyond. Let us hope, with him, and in his own words, "When the light of life goes out there is a new radiance in eternity, and somehow the glow of it relieves the darkness which is left behind. Never a death but somewhere a new life; never a sacrifice but somewhere an atonement; never a service but somewhere and somehow an achievement."

Railway Age Offers $50 Additional Prize

Widespread interest is being shown in the contest for the best paper on railroad fuel economy announced by the International Railway Fuel Association. The prize of $100 offered by the association for the best paper on this subject submitted by a locomotive engineman, fireman, trainman, conductor, brakeman or switchman has been supplemented by the railroads which in many cases are offering up to $100 additional prize to any local winner. Realizing the importance of the subject and the amount of time and effort involved in preparing a paper of prize winning caliber, the *Railway Age* offers to increase this prize by $50, and another railroad paper offers $10. On quite a few of the roads the total prize for the winning paper will, therefore, amount to $260, and this incentive will doubtless prove sufficient to bring out many papers with constructive, practical suggestions on fuel economy. The closing date is August 31, 1923. The International Railway Fuel Association is to be congratulated on its initiative in inaugurating this contest.

Cleaning Ballast Mechanically Saves Money

One of the more marked developments in the maintenance of way department in the last several years has been the increased use of mechanical equipment for cleaning ballast. Presumably this has come about largely through the imperative necessity of getting this work done at a time when the labor supply was distinctly short. Needless to say, it has been a step in the right direction for, in addition to enabling a railroad to get the work done when perhaps it could not otherwise be accomplished, it has also shown actual money savings in costs per rail length in almost all cases. The effect of clean ballast is far reaching and presents savings over foul ballast that are difficult to estimate but which are acknowledged to be considerable. Clean ballast means better drainage, more track easily maintained with less labor, fewer slow orders, less expense and better train operation. Another factor of almost equal interest at the present time is that the use of mechanical equipment will permit cleaning long stretches of track in the time ordinarily consumed in cleaning a few rail lengths under the old hand labor methods. Furthermore the ballast is cleaned much deeper than by hand methods often reaching depths as low as 14 in. below the bottom of the ties in the track centers and there is far less loss of material. Different classes of equipment have been used successfully, varying from portable machines up to units requiring a locomotive crane and a gondola. It is certainly a phase of maintenance work which merits strongly the attention and support of executive, operating and maintenance officers generally.

Where Signaling Replaces Men

The savings effected by the installation of signals and power-operated switch machines are most readily appreciated where such installations enable an immediate reduction to be made in the number of flagmen or switchmen required at bridges, yards, or railroad crossings. At a gauntlet-track bridge on a certain road where three shifts of two flagmen were formerly required at a total cost for wages of $8,640 a year, an installation of automatic color-light signals has been substituted which costs only $495 a year for interest on the first cost, depreciation, maintenance and operation. This saving of $8,145 a year represents 493 per cent on the first cost of the signal installation. Another road has dispensed with the services of switchmen for three shifts a day by the installation of a single electric switch machine. These are typical examples of the savings that can be accomplished

by comparatively small expenditures for signal or interlocking equipment at many points. Numerous places on various roads present equal opportunities for savings with added advantage of expediting train movements. Operating officers may well co-operate with their signal engineers in investigating these points at which signals or switch machines will relieve traffic congestion. As these small installations can often be made in a comparatively short time there is still opportunity to secure the use of such facilities during the heavy traffic season of this year.

Inter-Shop Transportation Facilities

The Industrial truck—storage battery or gasoline driven—is coming steadily into more extended use in locomotive and car shops as well as in store houses, terminals, and freight houses. There is now available a wide choice in capacities and types of trucks, tractors and trailers so that a suitable unit may be selected to meet the peculiar requirements at different points. A crane truck with a long boom may be the unit selected for the roundhouse jobs while a husky little tractor that will haul several trailers may be chosen to move castings and other materials from the store-house and storage yards to the freight car repair shop. In some places these trucks rarely go out of the building, being used mainly to transport material from one machine to another or from the machine shop to the erecting shop. To expedite the movement of material by power truck it has been found advisable to provide ample and well defined aisle space, the edge of the aisle preferably being marked by a line of white paint. Smooth floors, well paved with wooden blocks or otherwise also have been found to be highly desirable as the costs of transportation are thereby reduced. At most points, however, occasions arise from time to time, where the field of usefulness of the trucks would be considerably extended by movements from one shop to another. At some points, and the number is by no means small, inter-shop transportation is just as essential as that within the shop itself. Cinder paths can be used but the loads carried are less and the required time longer than where smooth concrete passage ways are available. In order to insure economy of operation and to realize the fullest benefit of the shop transportation equipment, carefully laid out lines between shops and outlying points should be provided and these should be concrete or other material which will furnish a hard, smooth surface.

Preserve the Design Records

The stress analysis of old steel bridges is one of the important problems imposed on a bridge engineer and his office assistants. If records of the original calculations upon which the design of these old structures were based or if even the design specifications were available much of this work would be unnecessary, but unfortunately the value of preserving this information has often been lost sight of, with the result that many of the records have disappeared. If the plans are also lost it is necessary to supply new information concerning the details of the structure by measurements in the field, a process which is more or less expensive, depending upon the care with which the work is done. But even if this is necessary the bridge engineer has the satisfaction of knowing that the information can be obtained if he desires it. An entirely different condition exists with respect to the reinforced concrete structure, since once the plans have been destroyed there is no way of determining the nature of the steel reinforcement concealed within the mass of concrete. The use of reinforced concrete construction is relatively new. Consequently the need for investigating the older concrete structures or the possibility of the records of their design having been lost are matters with which the bridge engineer is not often concerned. However, the time will come when there will be just as much occasion for investigation of the older concrete structure as there now is for the recalculation of the stresses in old steel bridges and if the records should become lost the predicament of the bridge engineer would indeed be a serious one. As a means of forestalling this contingency the officers in charge of a certain highway bridge project provided a bronze tablet containing the principal reinforcing data which tablet was attached to the structure in a conspicuous place. While this is a fantastic expedient that has no application to ordinary railway practice it serves to emphasize the importance of insuring the preservation of design records.

A Substitute for the Cupola

In an article on another page of this issue, H. F. Grew, superintendent of motive power of the Akron, Canton & Youngstown, describes some cabooses of novel design which are being built by his road. On these cars the conventional cupola is displaced by side bays, with the idea that these will make possible closer observation of the train by the trainmen and at the same time provide a more comfortable car. The bays, as the name indicates, project a short distance beyond the side of the car and, instead of the customary sliding side windows, are provided front and back with long narrow windows equaling in width the projection of the bay from the side of the car. These end windows are hinged, thus providing for the ventilation of the bay and admitting the familiar odor of hot boxes much more readily than cupola windows which are so much higher from the ground. This, to our mind, is the most important feature of these new cabooses. On another railroad, by tacit agreement between the officers and the men, the cupolas are no longer in use—indeed many of them have been boarded up. Trainmen look over their trains from the ordinary side windows. These, it must be admitted, are rather small and somewhat difficult to use, but the officers of the road and, presumably, most of the men themselves, are of the opinion that the more frequent mishaps, such as hot boxes or brake rigging troubles, can be detected more readily from the side windows than from the cupola. The A. C. & Y. cabooses are in other details designed to provide a maximum of comfort for the crew and to make one of their chief duties, that of close observation of the train, as easy and as pleasant as possible. The bays are as comfortable in any weather as any other part of the car and are provided with one leg collapsible tables so that the conductor may, if he cares to, occupy one of them while doing his clerical work. Altogether the experiment which the A. C. & Y. is making is most interesting and, after the cars have been given a thorough trial, railroad men will doubtless be glad to hear whether or not they have actually succeeded in bringing about closer and more effective observation of trains by the train crews.

How Not to Deal With the Public

The employees of the Public Service Railway Company, which operates virtually all the electric lines in northern New Jersey, have been on a strike since August 1 and the company is making no effort to operate any cars. Probably three-fourths of the 3,000,000 population of New Jersey resides in the territory served by this company, which includes all of the state's largest communities excepting Atlantic City. The tie-up is felt particularly in the larger centers of population, where buses, sight-seeing cars and trucks which have been pressed into service since the strike are insufficient to pro-

vide adequate transportation. The company's employees struck for higher wages which the company says it cannot afford to pay. This may be true. The municipalities served by the Public Service Company have permitted jitney competition with the trolley cars to such an extent that many of the lines are doubtless operated at a loss. Experience should have shown, however, that however justified a public utility company may be in dealing sternly with the public, it cannot afford to do so; the public thus dealt with can too easily, justly or unjustly, wreak its vengeance on the company. It is charged that the Public Service Company welcomed this strike in order to enable it to bargain with public authorities for the permanent discontinuance of service on unprofitable lines, the elimination of jitney competition or raising the fare from eight cents to ten cents. These charges may be utterly false but they are not refuted by the failure of the company to attempt to operate cars with employees who would work for the wages it can afford to pay. Much has been said of the railroads' appreciation of the value of favorable public opinion, but we know that no railroad would be so regardless of this force as to close up shop completely because of a strike without making any effort to keep going. Certainly they showed no signs of any such disposition last summer. The railroads have still a great task before them in cultivating public opinion and they can learn how this work should be carried on by observing the failures as well as the successes of other public utility companies in this line of endeavor. The conduct of the Public Service Company in this strike affords a striking example of how not to deal with the public.

Record-Breaking Traffic and Operating Efficiency

THE NEW HIGH WEEKLY RECORD in the loading of cars with freight made by the railways in the week ended July 21 calls attention to two important facts. One of these is that the country is witnessing almost if not quite as large an increase in freight business as ever occurred in history. The other is that it is being given the benefit of probably the greatest increase in operating efficiency in the history of its railways.

Between 1910 and 1913, both peak years, the increase in freight business was about 47 billion ton miles. In the next two years, 1914 and 1915, business declined. In 1916 it recovered and set a new high record and the increase in freight traffic between 1913 and 1916 was about 45½ billion ton miles. These are the largest increases in the past.

The increase between 1920 and 1923 is comparable with that between 1910 and 1913 and that between 1913 and 1916. The business of the year 1920 broke all records and was followed in 1921 and 1922 by a heavily reduced traffic. Up to and including the week ended July 21, this year, the number of cars of freight loaded was 11½ per cent greater than in the corresponding part of 1920. In the first four months of the year an increase of 11.4 per cent in car loadings resulted in an increase of 10 per cent in tons carried one mile. It is reasonable to conclude, therefore, that the number of tons carried one mile in the first seven months of the year exceeded the ton mileage of the corresponding months of 1920 by 10 per cent. If the traffic of the entire year should be 10 per cent greater than that of 1920, the total increase over 1920 would be about 45 billion ton-miles, which would closely approach the previous record increases.

In almost all past years traffic has steadily increased until it reached its maximum in the late summer and early fall months. The largest freight business ever handled in four months of any previous year was in July, August, September and October, 1920, total car loadings in these months being 16,337,107. It is an interesting fact that the total car loadings in the four months ended on July 21, 1923, were slightly larger than in these previous record-breaking summer and fall months of 1920, being 16,524,469.

Perhaps the most remarkable fact relative to the largely increased freight business being handled this year is that in spite of it the car shortage which existed early in the year has been changed to a car surplus which is steadily increasing. In past years of heavy business, such as 1916 and 1920, the large increases in traffic resulted in car shortages. On September 1, 1920, for example, the car shortage reported was about 140,000 cars. On the other hand, while in the early part of the year 1923 there was a car shortage, in the week ended July 21, when total car loadings amounted to 1,028,927 cars, the highest record ever made in any week, there was a net surplus of almost 72,000 cars.

The reason for the success of the railways in handling such a largely increased traffic without any car shortage cannot be found in the increase in their facilities which has occurred since 1920, because the increase in facilities has been small. The explanation is to be found in a remarkable, and perhaps unprecedented, increase in transportation efficiency. Detailed operating statistics for the Class I roads as a whole are available only for the first four months of 1923, but these, when compared with statistics for the corresponding part of 1920 as in the accompanying table, are sufficient to tell the story:

OPERATING STATISTICS, FIRST 4 MONTHS 1920 AND 1923

	First 4 mos. 1920	First 4 mos. 1923	Increase per cent
Average miles per car per day	22.2	26.5	19.4
Average tons per loaded car	28.3	28.2	...
Average ton-miles per car per day	445.	501.	14.8
Average cars per train	34.4	38.	10.5
Average net tons per train	671.	700.	4.3
Average miles per locomotive per day	59.6	60.9	2.2
Net ton miles per mile of road per day	4,792	5,264	9.8

Net ton miles per car per day, the real measure of the amount of service rendered with each car, increased 14.8 per cent. The increase in the average service rendered with each car was entirely due to the increase in the average miles traveled by each car daily, which was 19.4 per cent. For their success in speeding up the movement of cars the railways are largely indebted to the shippers who have co-operated as never before by loading and unloading cars promptly. Average cars per train increased 10½ per cent, a very marked increase in efficiency for which the railway managements deserve the entire credit. Although there was this increase in the average number of cars per train the average increase in tons per train was only 4.3 per cent. This was due to the fact that there was an increase in empty cars to be hauled in each train, the ratio of loaded to total car miles in the first four months of 1920 being almost 71 per cent and the first four months of 1923 only 67.2 per cent.

The fact that freight business has continued steadily to increase throughout the year thus far is a very good indication that it will continue to increase, until the end of October. Assuming that this will be the case, the transportation situation that will exist in the fall and early winter months is a subject for interesting speculation. The increase in car loadings thus far this year has been 11.4 per cent as compared with 1920, and there seems at present no good reason for doubting that relatively this great an increase in the business offered to the railways will be maintained. The largest number of cars loaded with freight in any week in 1920 was in that ended October 16 and was 1,018,539 cars. If the demands of shippers for cars be maintained on the same scale as in the first seven months of the year there will be a demand, when business reaches its

peak in October, for the loading of approximately 1,236,000 cars. In view of their performance thus far this year it would be hazardous to predict whether the railways will or will not be able to make this record; but if they do it will be a very extraordinary achievement.

Increasing the Capacity of the Existing Plant

A RAILWAY is to be commended when it increases its capacity for handling traffic by adding to its facilities. It is still more to be commended when it achieves this result by the more intensive use of tracks and equipment already available, for this conserves funds which it would otherwise be necessary to expend and restricts the increase in the amount on which a return must be earned.

The roads have spent relatively large sums in recent months for additions to their fixed properties, although, measured in terms of the facilities provided, the increase has been smaller than in many previous years. Greater expenditures have been made for cars and locomotives, although these have in large measure gone to make good the retirements of the last two or three years. As a whole, therefore, the roads have a plant only slightly larger than that of 1918.

With this plant they have handled a traffic heavier than in any previous period in history. During seven of the last nine weeks more than 1,000,000 cars have been loaded with revenue freight, and during two of these weeks more cars were loaded than in any previous weeks in history. During the week ended July 21 a new record for one week was established when 1,028,927 cars were loaded with revenue freight, while on the final day of that week the number of loaded and empty cars handled exceeded that of any previous day on record by over 5,000.

These records have been established during what is normally a period of relatively moderate traffic. If the trend of former years prevails a still further increase of at least 15 or 20 per cent in the demand for transportation may be expected by October. If the traffic is to be handled without congestion, car shortage and delay, it will be necessary for even better methods to be used than those which have made possible the splendid records of recent weeks. Some relief will be afforded by the receipt of cars and locomotives now on order and by the completion of improvements to tracks and other fixed facilities now in progress. For all practical purposes, however, this additional traffic must be handled with the facilities now available, and measures must be adopted which will cause more intensive utilization of these facilities. This will call for maximum attention to every detail of operation which will tend to reduce delays and to keep cars moving.

To emphasize the importance of this subject and to direct attention to it, we have announced a contest on "Means of Increasing the Capacity of a Line" to which we invite contributions. Discussions should be limited to those methods which contemplate the more intensive use of the existing facilities to the exclusion of such relief as may be secured through additions to the plant. Methods of demonstrated merit should be described to the exclusion of untried theories, for the judges will base their awards on the practicability of the methods described in meeting the *present* conditions and will give particular attention to those which *have been* found effective and the results secured by them. To stimulate interest prizes of $50 and $35 will be awarded for the first and second best papers received, respectively. All contributions should be addressed to the editor of the *Railway Age*, 608 South Dearborn street, Chicago, and must be received by August 25 to be considered by the judges.

New Books

The Engineering Index. 675 pages. 6½ in. by 9½ in. Bound in cloth. Published by The American Society of Mechanical Engineers, New York City.

This is the twenty-first volume of the Engineering Index and is the fourth one to be issued by The American Society of Mechanical Engineers. It contains a brief review and the indexing of engineering articles on a wide variety of subjects appearing in some 1,300 periodicals, reports and other publications which were regularly received during the year by the Engineering Societies Library. These periodicals cover all the major foreign countries, as well as the United States. The contents of the book have been carefully indexed and cross indexed and contain a larger number of references than have been included heretofore. Closer attention has apparently been given to the details which make this form of an index or reference book of real value to a reader. An example of this is evidenced throughout the volume by extended listings of references to bibliographies on various subjects where such are available.

Fire Losses—Locomotive Sparks. By L. W. Wallace, 203 pages, 6 in. by 9., 111 illustrations, bound in leather. Published by Barr-Erhart Press, New York.

Comparatively little has been printed on the subject of fire losses from locomotive sparks and means for minimizing such risks. The need of spark arresters, however, was appreciated even during the early development of the steam locomotive. One portion of this book describes their evolution up to the present day. Valuable contributions to the knowledge of spark arresters was obtained from the experiments made at Purdue University in 1902, the results of which were embodied in a book entitled, Locomotive Sparks, by W. F. M. Goss, and also from the report to the Railway Master Mechanics' Association in 1906. Since that time a number of laboratory and road tests have been conducted which have furnished considerable new data. This information has been placed in book form and is now available for the first time. Additional material on the subject of spark fire prevention and regulation of railroad fire hazards has been included which will be of interest to those desiring a knowledge of the subject.

The Interstate Commerce Commission, Its History, Activities and organization. By Joshua Bernhardt. 6 in. x 9 in. 169 pages. Bound in Cloth, No. 18 of the Service Monographs of the United States Government. Prepared for the Institute of Government Research. Published by the Johns Hopkins Press, Baltimore, Md.

There have recently been published several valuable books dealing with the Transportation Act and the activities of the Interstate Commerce Commission. This book is not intended to cover the same ground which has been treated by the larger and more detailed works which have preceded it in the recent past. The Service Monographs, of which this is No. 18, have been intended to explain to whoever might be interested the activities of the several departments of our national government. The various monographs have dealt with the Geological Survey, the Reclamation Service, the Federal Trade Commission, the Weather Bureau, etc. Other volumes in the course of preparation will include one on the Railroad Labor Board.

The present book contains a well-written and brief history of federal regulation of railways followed by a resume of the present activities of the commission and a description of the organization which it has built up to carry on its varied and extensive work. The book, as it will naturally be expected, contains a little or nothing in the way of opinion,

so that it adds nothing particularly new to the discussion as it has been ably carried on in the other recent books dealing with this general subject. The book's value lies in the fact that it contains in a comparatively small space many details about the work of the Interstate Commerce Commission not otherwise readily available. As is naturally to be expected, the book is a scholarly production. There happens to be one peculiar omission, however, in that in discussing the new provisions of federal railway regulation embodied in the Transportation Act, very little is said about the rule of rate making embodied in Section 15-a.

New Books and Special Articles of Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books

Communicable Diseases and Travel, by Thomas R. Crowder. (U. S. Public Health Bulletin No. 129) Sanitary precautions, and summaries of state laws regarding transport of persons with communicable diseases, in common carriers. p. 62. Published by Government Printing Office, Washington, D. C.

Co-operative Democracy: Attained Through Voluntary Association of the People as Consumers, by James Peter Warbasse. Co-operative movement, its purposes and methods, and its relation to other economic systems, p. 513. Published by Macmillan, New York.

Periodical Articles

British Railways in American Eyes. Consolidation's Prospects, Parallels and Limitations, by William Peter Hamilton. Barron's, July 16, 1923, p. 5, 12.

Development of the Federal Idea, by Marvin B. Roseberry. Federal power over railroads discussed, pages 145-156, 158. Tendencies toward Federal concentration, pages 165-168. Author is justice of the Supreme Court of Wisconsin. North American Review, August, 1923, p. 145-169.

The Greek State Railway Situation, compiled from reports of U. S. consular officers at. Athens. Commerce Reports, August 6, 1923, p. 380-381.

The I. C. C. and Virginian Railway; Recent Decisions Point to Indirect Enlargements of Interstate Commerce Commission's Powers. Index, pub. by New York Trust Company, July, 1923, p. 5-6.

Keep the Freight Moving! Fact That Average Freight Car Consumes Nine-Tenths of Its Total Trip Time in Terminal Delays is Cited as Ample Proof of the Need of a Practical Scheme to Reduce Terminal Expenses, by W. J. L. Banham, American Industries, August, 1923, p. 15-16, 26.

Reclassification of the United States 1920 *Occupation Census by Industry,* by Carl Hookstadt. Contains tables showing numbers of employees and officials of principal industries including the various transportation industries. Monthly Labor Review, July, 1923, p. 1-14.

The Recovery of Agriculture, by David Friday. An optimistic survey of the farm situation. American Review of Reviews, August, 1923, p. 181-185.

Repairing Locomotives and Freight Cars in Quantities, by Wm. B. Fergusson. Part 4 of his "Practical Methods for Planning Work." Repair schedules of various roads. Management and Administration, August, 1923, p. 185-190.

Scrapping of "Lame-Duck" Roads Would be Blow to Country. Cummins Argues in Reply to Senator Capper's Proposals. Last of the Series of Articles by Senator Cummins on the Railroad Problem. Washington, D. C. Post, August 1, 1923.

Letters to the Editor

A Cure for Over-Regulation

BANGOR, Me.

TO THE EDITOR:

We hear and read much in these days, a great deal of which is well founded, concerning over-regulation of the railroads. It is certainly true that there exists a tendency to carry governmental regulation to very great length through the embracing of small details of management and operation that had much better be left to the best judgment of the railroad executives themselves, allowing them to act as seems good in view of their knowledge of conditions on their respective lines. As typical of this regulating tendency we may remember having read, a few months ago, that about 134 railroad bills were awaiting the attention of Congress, some of these bills being of very trivial nature indeed. Many such will not, of course, ever get very far, but the fact that they were originally drafted is a symptom of the existing mania for proposing regulatory measures regarding all phases of railroad activity.

If followed out to the last analysis, it will be found that practically every restrictive law upon the statute books is there because somebody has abused a privilege. Such abuse of privilege is generally brought about through the fact that, in the starting of an entirely new kind of business enterprise, those engaged in it are apt to conceive of it as only an agent for the obtaining of money and power, all other considerations being liable to sacrifice toward that end. So long as the industry remains of little consequence this may work comparatively little harm but, should it grow, as has the railroad business, until it be entitled to rank with industries of first importance, then any form of exploitation becomes oppressive, the general patronizing public rebellious, and recourse of the statute books necessary. The railroads, throughout their career, have seen bitter experiences, but the ideal of service must and will become strong enough to overrule the lower ideals which have previously dominated and made possible the wrongs that were perpetrated.

We cannot legislate goodness into anybody, but we can curb evil propensities. The railroad, like every other great industry, needs just enough governmental regulation to restrain such of those engaged in it as may happen to be selfish, incompetent, or unscrupulously minded, from inflicting injury upon investors, patrons, and employees and to bring to account those guilty of misdemeanor. This is one of the great and important functions of government. We do not need, and should not have upon the statute books, a mass of law pertaining to trivialities, thereby causing many to lose respect for all law. We should aim at a barely protective minimum as the better policy. But how to squelch the overzealous regulator?

When everybody engaged in the railroad service is willing to get right down to sound railroading, which means the transportation of persons and things from place to place with all possible safety and dispatch, incurring the least expense consistent with good service, we may confidently look for a falling off in the production of legal formulas because this practice will not be so popular with the public when once it has had the experience of a period of courteous and generally satisfactory service.

Our need is for less law and more religion. Less attention to technicalities and "red tape" but more simple and straightforward dealing. Thus, to great extent, may we hope to assist in making the crooked straight and the rough places plain.

W. A. R.

The Transverse Fissure Problem

CHICAGO.

TO THE EDITOR:

Great weight must be given Mr. Howard's latest report on transverse fissures abstracted in the *Railway Age* of August 4, page 210, because he writes as a keen observer, one of the most expert of physicists and with an experience of many years devoted to the study of steel and the behavior of rails. It is certainly with no intentional disrespect for his views that the question of the formation of transverse fissures is discussed without complete acceptance of his theories; for, after all, Mr. Howard's explanations are more theoretical than would be the case if sustained by more extensive experimental data.

As a matter of fact, the prevalence of transverse fissures is not nearly as alarming as an impressionist would gather from reading Mr. Howard's report. A total of 5,000 heats from one mill on one road has shown fissures in about 3.6 per cent of the heats in about twelve years of service and in approximately one rail in 1,500. That case probably represents fair average conditions and by no means indicates a frequency of occurrence that need alarm the traveling public, for the same lot of rail has yielded one other type of failure in each 190 rails, or about eight times as many failures of other kinds as of fissures. Nevertheless rails containing fissures constitute the most dangerous and therefore the most important class of failures with which the railroads are now involved for they may give no warning prior to complete rupture and trains are badly wrecked by the sudden failure of a rail containing one. But other wrecks of a serious nature have occurred from other types of rail failures; for instance, broken bases, often involving complete fractures, have probably given as much trouble in the past, and perhaps occasioned quite as much argument as fissures now afford. Failures due to broken bases have been almost completely eliminated; some might say by changing the design of the section, and others by superior manufacturing methods; but, at all events, the disease finally yielded to treatment and the fissure problem should not be despaired of easily.

Mr. Howard's well known determinations of the strains in rails due to cold rolling are open to no argument. That compressive strains, caused by the rolling action of the wheels on the surface metal of the rail head, must be balanced by tensile strains in the interior, is admitted. But whether these tensile strains alone, and positively by the aid of no other agency, actually rupture the interior metal in good steel and bad and so produce internal fissures is obviously unproven, and will not be conceded without an abundance of supporting facts. It is true that very little is known about the effects of internal strains or even of the fatigue of metals; but considerable advance has been made in other directions which, from a metallurgical point of view; quite invariably throws suspicion, if not entirely fixing the blame, on the character of the steel that does not possess the satisfactory qualities of its neighbor when under the same conditions of service.

The collection of data pertaining to the occurrence of fissures is interesting and gives information that, of course, should have been produced by the rail users long ago. In some respects they do not go far enough, for the locating of each fissure in the track is not especially impressive by itself, except as showing that certain locations have been so susceptible to the development of fissures that railroad travel was extremely hazardous. It would vastly increase the importance of the data to show the location of the failures by heat numbers, and then the heats by mill rollings, and in that way bring out the point, if possible, that quite regardless of location certain heats are more prone to develop fissures than others.

The rails comprising 25 consecutive miles of line on one road produced several hundred fissures—so many that an accurate count was quite impossible, yet three was comparative freedom from fissures in the track for many miles on either side. That short stretch of track was composed chiefly of rails from one rolling of 61 heats. Following the removal of these rails the matter of fissures fairly subsided on the remaining 3,000 miles of track and, except in sporadic cases, has not been a serious matter since. Another case is recorded where the rails of a single heat developed fissures although laid on different lines of the same road in four different states. These, and similar cases, in no way reflect on Mr. Howard's general theory, but emphatically show that some rails are much more apt to develop fissures than others subjected to precisely the same effects productive of cold rolling strains. Thus, in general, his theory is sustained but with the important reservation that there may be a contributory if not a prime defect in the steel to account for the great differences in the effect of cold rolling strains. If split heads differ from regular fissures chiefly because of the presence of an internal seam in the steel, why may not some other inherent defect provoke the original nucleus of the transverse fissure?

Not infrequently the rails of a single rolling give peculiar results in service, and emphasize the point that some frailty of the steel may greatly facilitate the development of fissures. The rails of 61 heats rolled in three days at one mill have yielded over 40 fissures in 10 years of service on a certain railroad and those fissures have been confined to 13 of the heats. Critics of Mr. Howard's theory will ask why 80 per cent of the heats, or say 99.5 per cent of the rails in this case, have been immune from fissures, notwithstanding the effects of cold rolling that must have been produced in all of them by practically identical traffic conditions. True, the answer is difficult but an analysis of many similar instances points so strongly to the possible, and probable, presence of some defect of good mill practice that the matter becomes one for further study and investigation, rather than an admission that all rails are dangerous because the wheel loads are too heavy.

A fourth feature should be added to the list in Mr. Howard's concluding remarks on what he regards as constituting the rail problem. Manifestly of more importance than any other feature of the rail problem is the matter of obtaining a good sound steel, properly treated and rolled into a rail. The first item in the list therefore should be "Quality of Steel." In many respects that is the crux of the rail problem. On it to a very large extent depends the success of the rail as a girder; the abrasive resistance to the wheels; and, not remotely, the influence of the wheels toward cold rolling with which may be associated matters involving the load carried by the small contact between wheels and rails. Good steel is an asset, bad steel is a terrible liability. High carbon open-hearth rails, and the process of making them, are a comparatively new thing. Their production and use have been developed largely by force of circumstances. In some respects they have not given the results anticipated and certainly many details of manufacture have not been given the studious attention required of such an important product. Is the composition usually specified for present day rails (and frequently not obtained) the best suited, or has it been arrived at by mere rule of thumb? Are the large ingots used, weighing from 8,000 to 14,000 lb., suitable for the rapid reduction to common section rails in from 18 to 30 passes? Are the common soaking pit methods of treating those ingots adequate assurance against the evils to which high carbon steel is so susceptible? What are the actual effects of sonims in steel, and if the presence of some impurities can be restricted by proper furnace practice and control, why venture the risk of introducing them by some later additions?

C. W. GENNET, JR.

Manager Rail Department, Robert W. Hunt Co.

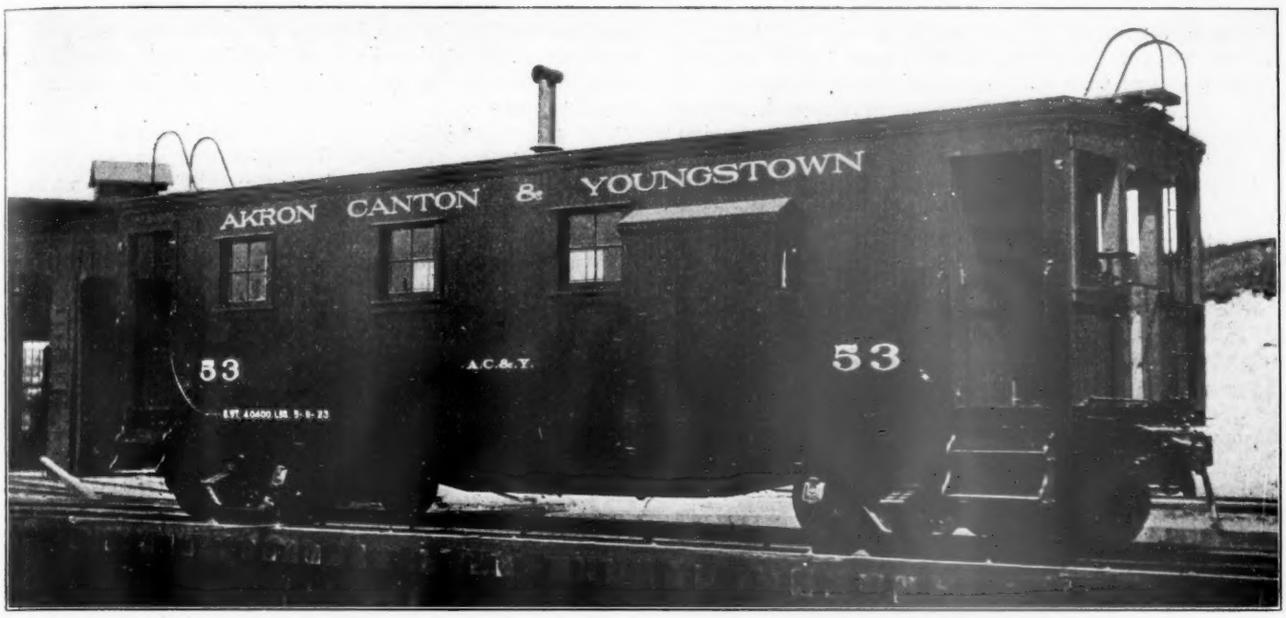


Fig. 1—Side Bay Caboose Used on Akron, Canton & Youngstown

The A. C. & Y. Builds Side Bay Cabooses

Side Bay Cabooses Facilitate Train Observation and Cost Less than Those with a Cupola

By H. F. Grew
Superintendent Motive Power, Akron, Canton & Youngstown

FIVE NEW CABOOSES have been constructed recently in the Akron shops of the Akron, Canton & Youngstown which provide a different method of train inspection from that furnished by the conventional cupola as used on other caboose equipment on this road. It was the thought of J. M. Hood, superintendent, that a caboose with many advantages could be constructed by the employment of side bays for train inspection and doing away with all overhead structures such as a cupola.

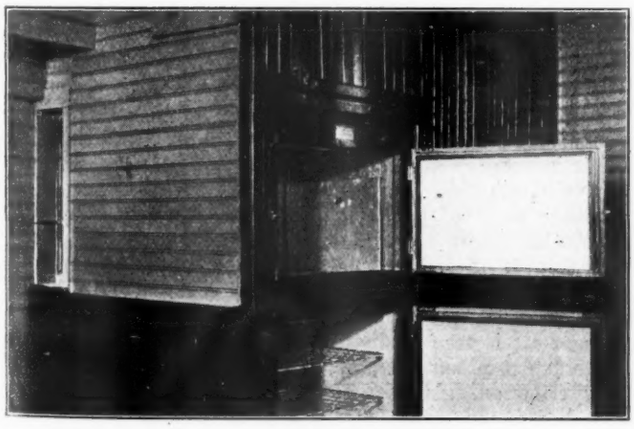


Fig. 2—A Standard Ice Box Is Built into One of the Cupboards

Using this idea as a basis a car was designed with framing and interior so arranged as to lend itself to side bay construction. The floor plan layout permits of an extremely well braced frame and also gives a convenient interior arrangement. All cupboards and lockers are located at one end in order that the whole car can be comfortably heated by a moderate size stove, there being no restrictions in the car which would block the heat travel from one end to the other. The four bunks are all concentrated at the other end of the car. Desk, stove, sink and side bays are located at the middle of the car. The cars are well lighted by six large windows having four 12 in. by 12 in. panes of glass, so located as to height that a trainman can see through the windows when seated on a bunk or without bending over when standing.

The side bays are provided with tall, narrow observation windows at each end of the bay, which permit the trainmen to see along the train. These windows are hung on hinges so that they will open outward. This ventilates the bays and also allows the familiar smell of a hot box to reach the trainmen, thus warning them of journal trouble. This last feature is of interest, as the side bay observation windows are lower down than cupola windows, and the hot box scent is much more likely to be observed by the trainmen. Torpedoes, oil, coal, and other equipment are stored in suitable lockers under the bunks. A large drop table can be lowered from one side of the car over the bunks. A three-draw panel desk and stool are provided for the conductor. An enameled sink and stove are located in the middle of the car. A standard ice box with front icing upper compartment is built into one of the cupboards, as shown in one of the illustrations.

The side bays extend over the side walls of the car and are each equipped with two seats, facing, which extend from

the outside wall of the bay toward the center of the car for a length of 30 in.

These cars were reconstructed from wood frame box cars, portions of which were in a state requiring replacement. All wooden parts of the original cars were removed, leaving trucks, steel center sills, steel cross ties and draft rigging. The coiled truck springs were replaced by elliptic springs. In building the body of the caboose, the roof was made lower than on the original car as there was no need for the extra height. Owing to the steel floor structure of the original car vertical steps were used, thus allowing the platforms to extend to the side of the car. The frame work, with exception of carlines, is all wood above the floor structure. The platform frame work is of the box type as shown in Fig. 4. The cars are covered with prepared canvas roofing.

The side bay extends 7⅞ in. beyond the wall of the car. This offset, however, does not start from the floor of the car but from the level of the seat in the bay. This arrangement allows the car to have its normal width for 20 in. above the floor level and also for a space over the bay extension. In other words, the body of the car is offset to allow for the bay over as small a portion as possible. This arrangement also makes it easier for trainmen to board the car when it is moving at a high rate of speed.

The body is of double-wall and side-brace construction throughout with the exception of the side bays. The bay walls are of standard siding outside, laid vertical, and ceiling inside, laid horizontal, with a layer of prepared canvas between the two thicknesses of board in order to provide insulation. Studding was left out of this part of the car, as it was necessary to economize on space. In order for the trainman to utilize observation from the bays to the best advantage it is necessary for his line of vision to be as far out over line of the side of the train as is possible.

As has been stated the side bays are offset 7⅞ in. from the side of the car, this dimension being determined by the road clearances. The A. C. & Y. and operated properties all permit of a 11 ft. 6 in. side clearance within the limits of the body of the caboose. The body of the car is 9 ft. 2¼ in.

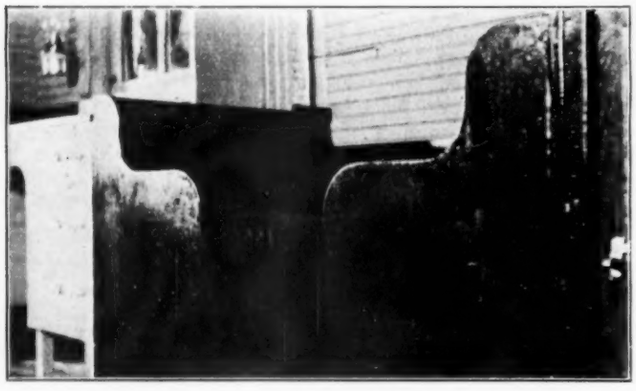


Fig. 3—A Close-up View of the Side Bay Seats—Conductor's Desk at Left

over siding, the same as the original car. With an overhang of 7⅞ in. for each bay, the total width over the bays is 10 ft. 6 in. This leaves a clearance of 6 in. on a side, from the bay wall, giving ample clearance for rocking of the body, uneven track, etc.

The advantages of a side bay caboose over an overhead cupola type are many. Most trainmen inspect their trains while rounding a curve. It is, therefore advantageous at times to view a train from one side of a caboose and then switch immediately to the other side, as the train may be rounding a compound curve. In the side bay caboose, with the two bays opposite, this vacillation from one side to the other may be safely made by stepping across the car, using the floor. With the cupola type of observation the trainman must often step across from one side to the other 5 ft. above the floor of the car; which, with a lurching car, may be dangerous.

The side bay caboose tends to promote efficiency in observation of trains. Owing to the fact that cupolas are almost always cold and drafty in inclement months and also owing to the relative inaccessibility of the cupola, the trainmen do not ride habitually in the cupola. On the other hand the observation seats of the side bay are comfortable, as warm as any other place in the car, and are highly accessible, so

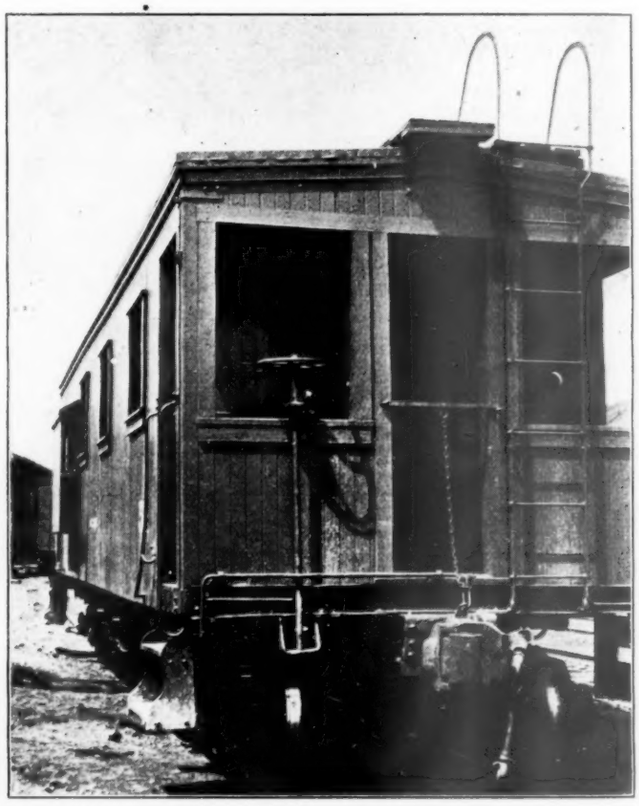


Fig. 4—The Platform Framework Is of the Box Type

that the tendency of the trainmen is to ride at all times in the bays. A single-leg removable table is provided which fits into either bay between the two facing seats. With this table it is possible for a conductor to occupy an observation seat and at the same time do his clerical work on the table.

Another point of advantage has been mentioned before. The cupola is hard to heat, for as fast as heat is carried to the cupola it is radiated owing to the large amount of window surface. The roof of the bay type cupola is without break, and the bays themselves have such a small offset that the heat is readily distributed to the observation seats. The arrangement of the lockers also lends itself to proper heat distribution. Another point with the bay construction, the roof of the car may be made lower than with the cupola type which further facilitates heating.

In addition the side bay brings the trainman lower to the ground and closer to the level of the hot boxes, which facilitates the discovery of such trouble.

In initial cost the side bay type of caboose is less expensive. Considerably less lumber and man hours are required for building the two side bays than for an overhead cupola. Also the roof of the bay caboose may be made lower.

It is much easier to build a bay caboose that will remain water tight than it is a cupola caboose, the point where the

cupola end wall rises from the roof being particularly difficult to keep water tight. This fillet is usually made water tight by the use of sheet metal or canvas, and after this material starts to leak repairs are made by renewal at considerable expense because of inaccessibility. The roof of the bay is made with a high pitch which insures long life. New canvas can be applied as easily as on the roof of a freight car.

The framing of the side bay caboose can be made more rigid than the cupola type. The framing of the cupola itself must be accomplished by studding reaching from the floor of the car to the cupola roof if cupola is to be made rigid. The ridge pole must be cut. With the bay caboose the framing may be made as with the standard box car, diagonal braces being omitted only where bays are installed. The ridge pole remains solid throughout the car. Extra side posts and studding for cupolas are not necessary. The framing of the side bay is laced to the side posts at each corner. Four

Fig. 5—Side Bays Extending Out Only a Short Way Greatly Facilitate Train Inspection

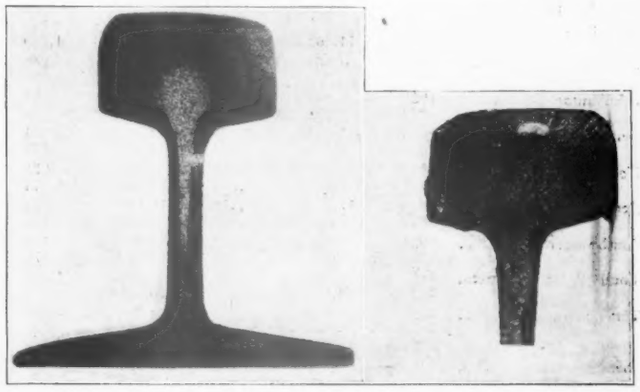
mortised horizontal cantilever beams 10⅜ in. long support the bay. A nailing strip and side plate join to these beams and complete the framework. The simplicity of this structure together with the unbroken roof make for low maintenance.

It should be stated that had these cars been made new from the rails up a slightly different design would have resulted. In this case it was necessary to conform to the steel floor structure. With variation of floor design structure possible, a better bay caboose could be obtained by making the body of the caboose slightly narrower than the design now in use. With the same overall width of bays, this would result in wider observation windows. While this would make the construction somewhat easier, it would not increase the observation possibilities greatly as observation is made only by viewing the train at a point farther distant from the track center than the wall of the average freight car, rather than from a point farther distant than the body wall of the caboose. The farther from the track center the bay wall is, the greater the possibilities of observation, but this distance is dependent on the clearances of the railroad. The side clearances on some roads will not allow of any width greater than that of the average box car.

A Transverse Fissure in an Old Rail

THE IMPRESSION that transverse fissures are peculiar to rails of recent manufacture is refuted by a failure of this character which occurred on the Seaboard Air Line on March 25 of this year in a rail rolled in 1888 or 1889. The fissure revealed is about one-half inch in diameter. The further impression that transverse fissures are confined largely to the mills with less exacting requirements is also refuted as this rail was rolled at the Lackawanna Iron & Steel Company's mill at Scranton, Pa., which long bore a reputation for excellence of product.

A five-foot section of the rail showing this fissure in one end was broken in a drop testing machine, revealing an-



A Sulphur Print of a Rail and a Photograph of a Head Showing the Transverse Fissure

other small fissure shown in the photograph. The etching shows considerable unsoundness and negative segregation, while the chemical composition is not in line with modern requirements. An analysis of this rail follows:

Carbon	.48
Manganese	1.30
Phosphorus	.061
Silicon	.06
Copper	.80

Another Car Loading Record

WASHINGTON, D. C.

A NEW HIGH RECORD for the loading of revenue freight was established, for the fourth time this year, during the week ended July 28, when the total was 1,041,044 cars. This was an increase of over 12,000 cars as compared with the previous week besides being 192,186 greater than the total for the corresponding week of last year and 245,612 greater than that for 1921. This was also the eighth week this year in which the loadings have exceeded a million cars. The increase was fairly evenly distributed among the different classes of commodities, the largest increase as compared with the week before being in grain and grain products. As compared with last year large increases were shown in coal, forest products, ore and miscellaneous. While all

districts showed increases as compared with last year the western districts combined showed an increase of only 15 per cent while the total increase was 22 per cent.

That the volume of traffic which the railroads will be called on to handle will continue to be large during the coming two or three months and will probably exceed even the record breaking figures of recent weeks as the grain traffic is added, was the conclusion reached at a conference of traffic managers of national trade associations with the Car Service Division of the American Railway Association held at Washington on August 2. Conditions in the principal industries were discussed from the standpoint of the number of cars that will be required to move the business of the rest of the year and as a result it was unofficially estimated that the weekly carloading total would reach at least 1,100,000 cars if not 1,200,000 at the peak point. This would exceed the peak record of 1920 by over 85,000 cars.

The conference was held at the suggestion of Donald D. Conn, manager of the public relations section of the Car Service Division, to supplement the information gained as the result of regional meetings of committees representing the shippers and the railroads and also to urge the early shipment of as much freight as possible before the fall peak. The views expressed by the traffic managers were taken as indicating some car shortage during the time of heaviest crop movement although less than has been experienced in some other years of heavy traffic. Representatives of the shippers of cement, sand and gravel expressed the opinion that they would need more cars during the second half of the year than they had during the first half because although they thought they had moved half of the expected year's business in the first half of the year as against only 40 per cent in other years the present indications are for a bigger year's business than was anticipated.

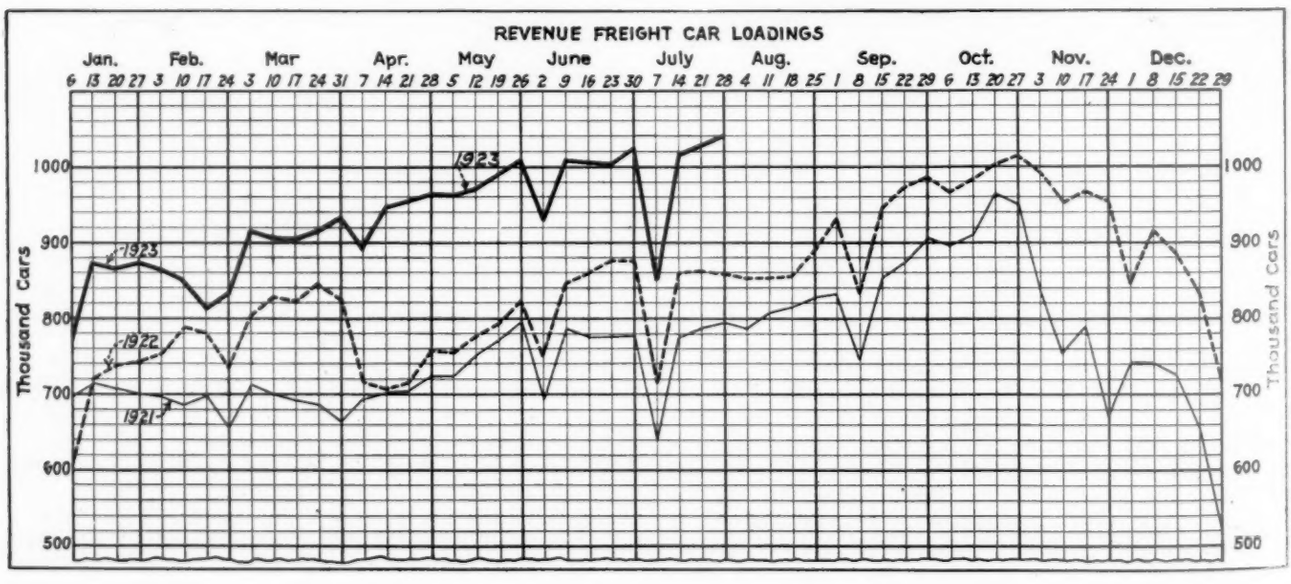
The traffic managers were urged to do everything possible to expedite shipments so that as much freight as can be moved early may be moved during the next 45 days before the peak of the farm products traffic is experienced.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, JULY 28, 1923

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded	Corresponding period	
										1923	1922	1921
Eastern	1923	9,785	3,120	55,527	4,180	6,317	9,204	65,292	96,441	249,866	.....	.....
	1922	11,806	2,489	8,880	1,789	5,282	7,139	66,675	92,741	.....	196,801	192,256
Allegheny	1923	4,163	2,451	60,308	7,004	3,600	16,702	49,173	83,203	226,604	.....	.....
	1922	4,068	2,301	19,583	4,106	3,096	13,665	49,901	80,177	.....	176,897	155,739
Pocahontas	1923	421	151	29,957	508	2,156	231	6,745	4,471	44,640	.....	.....
	1922	268	151	16,721	288	1,123	30	3,466	3,525	.....	25,572	28,339
Southern	1923	5,014	2,240	22,246	1,061	23,853	2,087	37,798	39,000	133,299	.....	.....
	1922	4,322	2,235	14,860	738	17,842	1,428	34,977	36,844	.....	113,246	110,245
Northwestern	1923	10,405	9,249	9,422	975	20,516	52,186	31,160	38,776	172,689	.....	.....
	1922	11,678	7,761	7,882	1,531	15,338	39,696	30,803	36,154	.....	150,843	117,265
Central Western	1923	17,046	11,535	12,664	382	12,528	2,818	35,104	58,143	150,220	.....	.....
	1922	19,363	9,365	5,272	456	8,733	2,487	34,194	50,130	.....	130,000	126,715
Southwestern	1923	6,326	3,103	4,422	164	8,829	405	14,774	25,703	63,726	.....	.....
	1922	7,141	2,366	3,097	179	6,203	427	13,108	22,978	.....	55,499	64,873
Total West. Districts.	1923	33,777	23,887	26,508	1,521	41,873	55,409	81,038	122,622	386,635	.....	.....
	1922	38,182	19,492	16,251	2,166	30,274	42,610	78,105	109,262	.....	336,342	308,853
Total all roads	1923	53,160	31,849	194,546	14,274	77,799	83,633	240,046	345,737	1,041,044	.....	.....
	1922	58,646	26,668	76,295	9,087	57,617	64,872	233,124	322,549	.....	848,858	.....
	1921	63,530	24,810	149,439	4,178	45,762	30,124	214,531	263,058	.....	.....	795,432
Increase compared	1922	.....	5,181	118,251	5,187	20,182	18,761	6,922	23,188	192,186	.....	.....
Decrease compared	1922	5,486	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared	1921	.....	7,039	45,107	10,096	32,037	53,509	25,515	82,679	245,612	.....	.....
Decrease compared	1921	10,370	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
July 28	1923	53,160	31,849	194,546	14,274	77,799	83,633	240,046	345,737	1,041,044	848,858	795,432
July 21	1923	46,275	32,454	190,788	14,888	75,808	84,307	240,182	344,225	1,028,927	845,548	788,034
July 14	1923	40,415	32,726	193,831	14,515	71,768	89,298	240,707	336,407	1,019,667	850,676	774,884
July 7	1923	31,069	25,122	160,218	13,770	54,176	73,596	209,480	287,317	854,748	707,025	640,535
June 30	1923	37,127	30,679	185,757	14,745	79,249	80,791	244,921	348,501	1,021,770	862,845	776,079

Compiled by the Car Service Division of the American Railway Association.

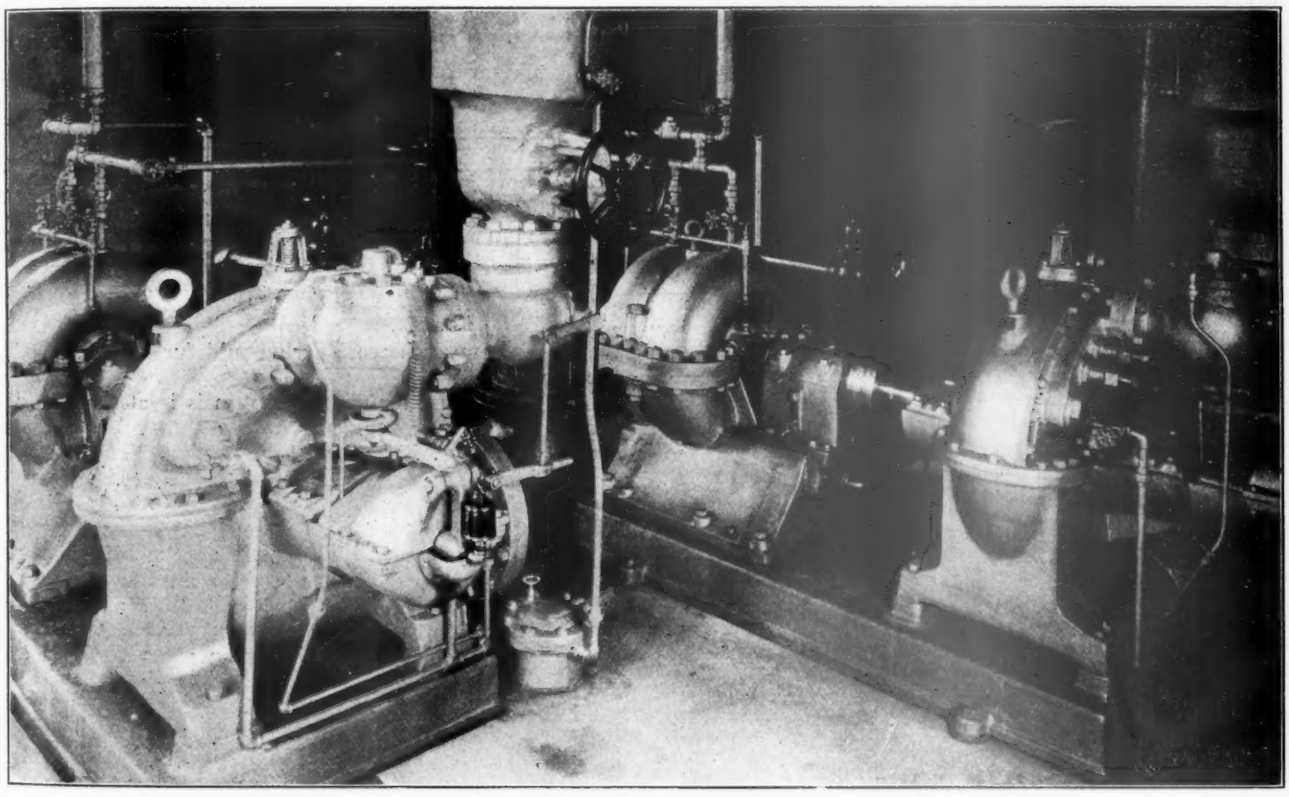


D. & I. R. Builds Terminal Fire Protection System

New Installation Provides Modern Facilities at Shops and Docks and Releases Tug at Two Harbors, Minn.

By O. H. Dickerson.
Principal Assistant Engineer, Duluth & Iron Range, Duluth, Minn.

THE DULUTH & IRON RANGE has recently completed an extensive addition to the fire fighting equipment for the protection of its ore docks, roundhouse, shops and other structures at Two Harbors, Minn. The original system, shown in fine dash lines in the drawing, was constructed in 1903, and was supplied by a connection to the Two Harbors city mains at the west end of First avenue. This system extended in a loop around the greater part of the shop buildings with one branch to the ore dock office. It comprised 3,900 ft. of cast iron pipe, nearly all of which was 6 in. in diameter and connected with 15 yard hydrants, each with connections for two 2½ in. hose.



A View of the Pumping Equipment

In front of the dock office it connected with a steel main carried overhead in the cross-walk between ore docks 1 and 5 and also with the 3 in. fire mains in each of the five ore docks. These ore docks had hose boxes spaced at intervals of about 240 ft. on the deck, intermediate walk and lower walk. Each box had 100 ft. of 2½ in. hose attached with a nozzle ready for service. The Two Harbors city pumping and electric plant, located 4,200 ft. east of the machine shop, has one highly efficient horizontal cross-compound condensing pumping engine with a capacity of 2,250 gal. per minute with the ordinary pressure of 90 lb. capable of being raised to about 120 lb. in case of fire. The station also has a compound duplex direct-acting steam pump of 2,000 gal. per minute capacity of low efficiency so that it is commonly held in reserve. It is doubtful if the boiler capacity of the station would keep both pumps in full capacity operation at fire pressure.

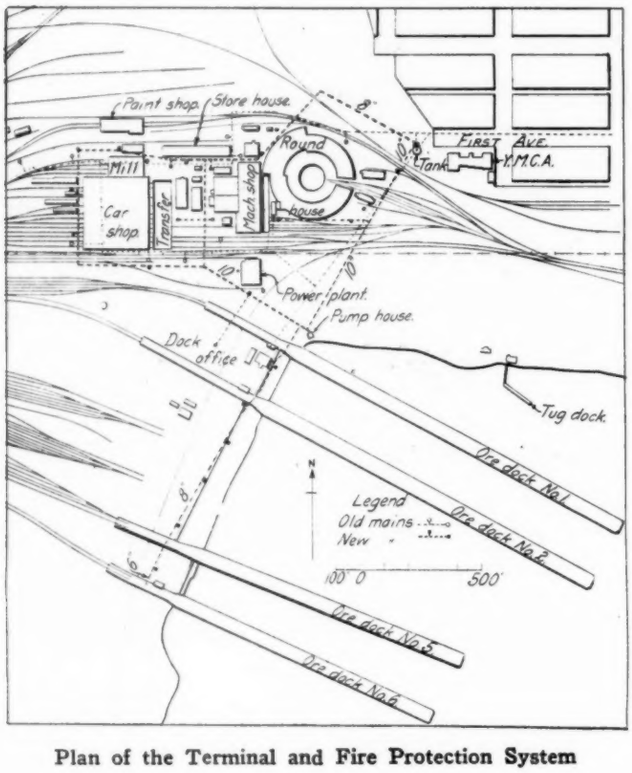
Between the city pumps and the connection to the railroad system there are about 2,650 ft. of 12 in. and 1,250 ft. of 6 in. main. Between these two points the entire water supply for the city of about 5,000 people is taken off. If the maximum city consumption is assumed at the rate of 216 gal. per day per capita, it would leave only 1,500 gal. per minute from the efficient pump for fire purposes, but if the boiler capacity could keep both pumps working to full capacity, this would give about 3,000 gal. per minute for fire fighting. Computation, as well as actual fire service, showed that due to the excessive head lost in the long 6 in. main this system could furnish only two or three good fire streams about the shop buildings and that when a larger number were tried the pressure fell so much that none were effective.

The branch from the northwest corner of the loop was added in 1908 to protect the lumber storage. In 1908 a duplex, electric-driven, power pump was installed as a fire pump on the ground floor of the dock office with an 8 in. underground cast iron main extending almost to ore dock 6 with 6 in. connections, one to the ore dock 6 main and two to the overhead main in the crosswalk between docks. For-

tunately, this pump, which was removed in 1916, was never called upon for fire service as it always developed hot boxes under test. The 8 in. main mentioned above was kept normally connected to the mains about the shops.

In August, 1910, the company, on the requirement of the insurance department of the United States Steel Corporation, placed in service a powerful fire tug having a capacity of 12,000 gal. per minute at 150 lb. pressure, or 6,000 gal. per minute at 300 lb. pressure. At that time there were five wooden ore docks containing, with their approaches, an average of about six million feet b.m. of lumber each. Fire injuring or destroying these docks at a time when they could not have been repaired or rebuilt in time for use during an ore shipping season would not only have reduced the railroad's income from transportation for a whole year about 80 per cent, but would have seriously handicapped a large number of ore mines for at least one year.

When 12 stalls of the roundhouse burned in May, 1912, it was a 1,300 ft. line of 3½ in. hose from the fire tug that saved the day, as so many hose lines were connected to the hydrants near the roundhouse that the pressure fell so low that none gave effective fire streams. A few months after that fire a dry main of 8 in. steel pipe was laid about 2 ft. below ground with five hydrants just south of the round-



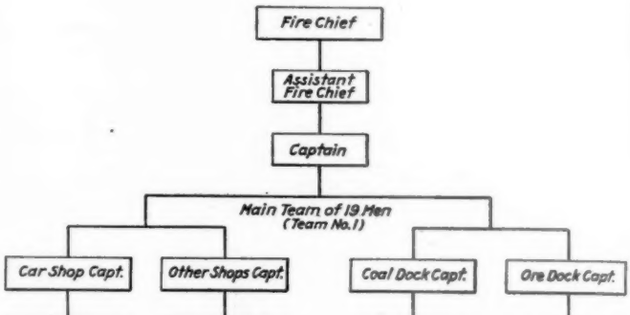
Plan of the Terminal and Fire Protection System

house and shops and with provision for quick connection to the fire tug.

Between 1910 to 1917 four of the wooden ore docks were torn down. The new ore dock, No. 2, has a steel frame and, with the remainder of the structure almost entirely of reinforced concrete, is practically non-combustible. Ore dock 6 has a main framework of steel with concrete bottoms, steel plate fronts and wooden partitions and deck, while ore dock 1 has steel frame work with concrete partitions and wooden deck fronts and bottoms. Ore dock 5 is a typical wooden dock of the design current in 1906.

The possibility of a serious fire on the ore docks having been so nearly eliminated, it was desired to do away with the heavy expense of keeping the fire tug in service, amounting to more than $25,000 per year. The plan adopted was to construct a new independent system extending in an irregular loop about the shops with a cross connection and to connect to this new system the 1908 main extending from the dock office over to ore dock 6. It was also decided, in order to care more effectively for the water front property, to put as large a fire pump on the company's towing tug as its boiler would supply steam for, that is, a steam-turbine-driven, single-stage centrifugal pump having a capacity of 2,500 gal. per minute at 65 lb. pressure. This supplies two nozzles, one 1½ in. and one 2¾ in., which would handle any water front fire likely to occur now at Two Harbors.

The passenger and freight depots, as well as the coal storage pockets, were left to their own system which is connected direct to the city's 12 in. main. Computation shows



The Fire Fighting Organization

that the system at the coal dock would furnish six effective fire streams.

The pump house for the new system is located at the slip end nearest the power plant. It is a two-story reinforced concrete structure, 22 ft. by 22 ft. in plan. The basement story, with a floor 8 ft. below mean low water, serves as a suction well. It is fed by a concrete pipe 30 in. in diameter and about 15 ft. long which is provided at its outer end with a brass wire screen of 30 sq. ft. area and ½ in. mesh. The pump room floor is located just to be safely above high water.

Especial care was taken to provide favorable hydraulic conditions in the piping. The suction pipes are short and vertical; they have no screen or foot valve and they enter the pump cases without any elbow. The discharge pipes are horizontal and enter the underground main with only a single turn each and that of only 45 deg.

The two fire pumps, which are duplicates, are underwriters approved two-stage centrifugal fire pumps, each direct-connected to a steam turbine and have each a rated capacity of 1,500 gal. per minute at 150 lb. pressure with nearly twice the volume at 90 lb. pressure. Two pumps were chosen rather than a single one of double the capacity on the ground of having less chance of failure. The steam-turbine drive was chosen at considerably increased cost on account of the greater reliability of the steam supply which is not dependent on any of the electrical equipment of the power plant. Steam is brought from the power plant in a 5 in. extra strong pipe welded continuously except at the expansion joint, insulated with 2 in. magnesia and laid in a concrete box about 4 ft. below ground. This main is kept continuously under full boiler pressure. The pumps are tested by bringing up to speed daily. The two fire pumps are connected only in parallel as this will give ample pressure at all the hydrants of the system. On a test November 16, 1922, ten good streams from 1⅛ in. nozzles with 200 ft. of 2½ in. hose on each line were concentrated on the roundhouse with but one pump in service.

The loop plan of mains was chosen because it provides more nearly uniform pressure at all hydrants than a single branching main and because it passes near most of the desired locations for hydrants, thus giving short branches. There are two 10-in. mains from near the pump-house, either of which can be shut off and still leave fair pressure and supply for the remainder of the system. The entire network is so subdivided by valves that in case of a broken main one section can be cut out and still leave the greater part of the system in good working order. The mains are of standard class D bell and spigot cast iron pipe laid to have 7 ft. cover over the top everywhere on account of deep frost penetration in this region.

The hydrants open with the pressure, hence open very easily. They have two hose connections, each provided with an external gate valve so that either hose can be regulated or shut off independent of the hydrant valve. The hydrants are so located that from 10 to 12 streams can be concentrated on any of the larger buildings readily, requiring few hose lines longer than 250 ft. Those on the new system with their enclosing wooden boxes are painted a bright yellow and distinguished by letters, while those on the old are painted red and numbered.

Six new hose cart houses have been located at convenient points about the system, each containing two small carts. These carts have a bed 12 in. by 28 in. by 60 in. with the bottom of the slats running longitudinally. The hose, connected up into 250 ft. lengths with the nozzle attached, is so folded into the cart that it is readily attached to the hydrant and then laid out in the direction desired by running the cart in that direction. The carts are designed to be handled readily by two men under ordinarily favorable conditions. An additional nozzle is provided on each cart and additional lengths of hose are located in the hose cart houses.

A building 12 ft. by 36 ft. is to be constructed, one part of which, about 12 ft. by 24 ft., will be provided with sloping racks along two sides and one end and used for draining and drying hose. Another part of this building will be used for storing the coats, hats, hip boots and mittens, provided for the main fire team and will be kept warm at all times, in order to maintain conditions favorable for the durability of the rubber garments.

The organization for fire fighting is shown in the chart in the second column of the opposite page.

The chief, assistant chief, captain and main team of 19 men, respond to all alarms for fires on railroad property at any time of the day or night and are paid their scheduled pay. The four smaller teams respond only to such alarms as are turned in from their respective parts of the property. It is planned that every team shall have a one-hour drill every two weeks and that the captain of the main team shall make a monthly inspection of all fire apparatus. The fire alarm system centers in the power plant and, in case of an alarm, one of the two men on duty there proceeds immediately to the pump house, starts the pumps and remains in charge until they are ordered stopped.

This system was designed by the engineering department of the Duluth & Iron Range.

Systematic Tie Distribution Insures Long Life

Under Plan Developed by Santa Fe, Timber Is Used in Service to Which It Is Best Adapted

A COMPREHENSIVE PLAN for the distribution of crossties has recently been put into effect on the Atchison, Topeka & Santa Fe, which has for its object the allocation of each species, grade and size of tie to tracks where the traffic, climatic and service conditions are those to which it is particularly adapted. The Santa Fe has 11,700 miles of line and more than 17,700 miles of track in 13 different states between Chicago and the Pacific coast, and obviously the conditions to which the ties are subjected both as to climate and density of traffic, vary widely. Different portions of the Santa Fe lines also are naturally tributary to different tie producing areas. The available sources of supply are: The yellow pine district of eastern Texas and western Louisiana; the mountain pine area of Arizona and New Mexico; the Douglas fir forests of the northwest and the California redwood and cedar areas.

The plan which has been developed for the distribution of these ties is the result of a detailed study of the supply and the service requirements of the road by a committee appointed by the operating vice-president. This committee consisted of the assistant chief engineer of the system and representatives of the four general managers and of the store and timber treating department.

Tracks Classified According to Traffic

As the first step in the development of this plan all tracks on the system were classified in three groups, according to the amount and character of the traffic which they handled. These groups have been designated as: (1) Class A track, important heavy traffic, main lines; (2) Class B track, unimportant main lines and heavy traffic branch lines; and (3) Class C track, light traffic branch lines.

Because of the marked effect of climatic conditions and particularly of the amount of rainfall on the life of ties, statistics were then compiled of the normal annual rainfall on the system by operating divisions. This rainfall varies from a minimum of 5 in. on the Arizona division to a maximum of 50 in. on the Beaumont and Galveston divisions. Those divisions with a normal annual rainfall of less than 20 in. were classified as dry districts and those with more than this amount as wet districts.

Three Grades of Ties Established

The Santa Fe has not adopted the standard tie specifications or grading of the American Railway Engineering Association, but all ties have been classified as No. 1, No. 2, culls and rejects. No. 1 ties include 6-in. by 8-in., 7-in. by 8-in. and 7-in. by 9-in. hewn and sawed ties of all woods. Number 2 ties include sound hewn and sawed ties of all woods slightly under 6-in. by 8-in. measurements and those rejected as No. 1 on account of slight defects. The No. 2 ties are, therefore, equal to the No. 1 ties in quality of wood and are given the same treatment, the difference being in size. It is expected that the No. 2 ties will give approximately the same service life as the No. 1 ties when used in lines of lighter traffic. In allocating the No. 2 ties to certain lines, an effort was made to provide an outlet for such ties of this grade as it is necessary to take as a by-product incident to the economical purchase of No. 1 ties rather than to encourage the use of smaller ties. The committee expressed the

opinion that a tie 7-in. thick with a 9-in. face was desirable.

Special attention was given to the distribution of hardwood ties, which, prior to the development of this plan, had been used indiscriminately on tangents and curves alike as long as the supply lasted. A survey of the purchases of recent years showed that it was possible to secure somewhat over a half million hardwood ties annually. A tabulation of the amount of curvature on the system showed 1,984 miles of curves on running tracks on main and branch lines. Of this 634 miles are on curves of less than two degrees. On the basis of the 12-year life of hardwood ties on curves a sufficient number were in sight to justify the committee in requiring that they be inserted in (1) all running track curves of two degrees and over (2) engine leads and other important tracks in yards (3) sharp curves in industrial and side tracks, particularly where they are located in paved streets (4) on short tangents between curves on mountain grades on Class A track. Of the hardwood ties, gum has seemed to give the most satisfactory service in the semi-arid territories from the fact that it resists checking. For this reason the committee instructed that the quota of hardwood ties for the Coast lines be filled with gum ties as far as possible.

Treatment Was Considered

In developing its recommendations the committee also gave careful consideration to the character of treatment which should be given the ties. This investigation was primarily on the road's own extensive records of service of various kinds of woods treated with different preservatives. It was found that zinc-treated ties showed a maximum life of nine years in wet territories and 11 years in dry territories, their failures in the latter areas being due to excessive checking and shattering. On the other hand, the records of the road support a 16-year life for ties treated with creosote or with a mixture of creosote and oil ranging from equal proportions to 70 per cent creosote and 30 per cent oil. The creosote and creosote-oil mixtures were, therefore, adopted for general use over the system with the exception that in the semi-arid territory the conclusion was reached that New Mexico pine or spruce or Douglas fir treated with a mixture of creosote and oil will give a much longer life and resist checking and brooming to a greater extent than when treated with either creosote or zinc chloride. Owing to the fact that New Mexico pine and spruce ties can be bought more cheaply than Douglas fir it has been decided to purchase as many of these ties as possible.

Method of Distribution

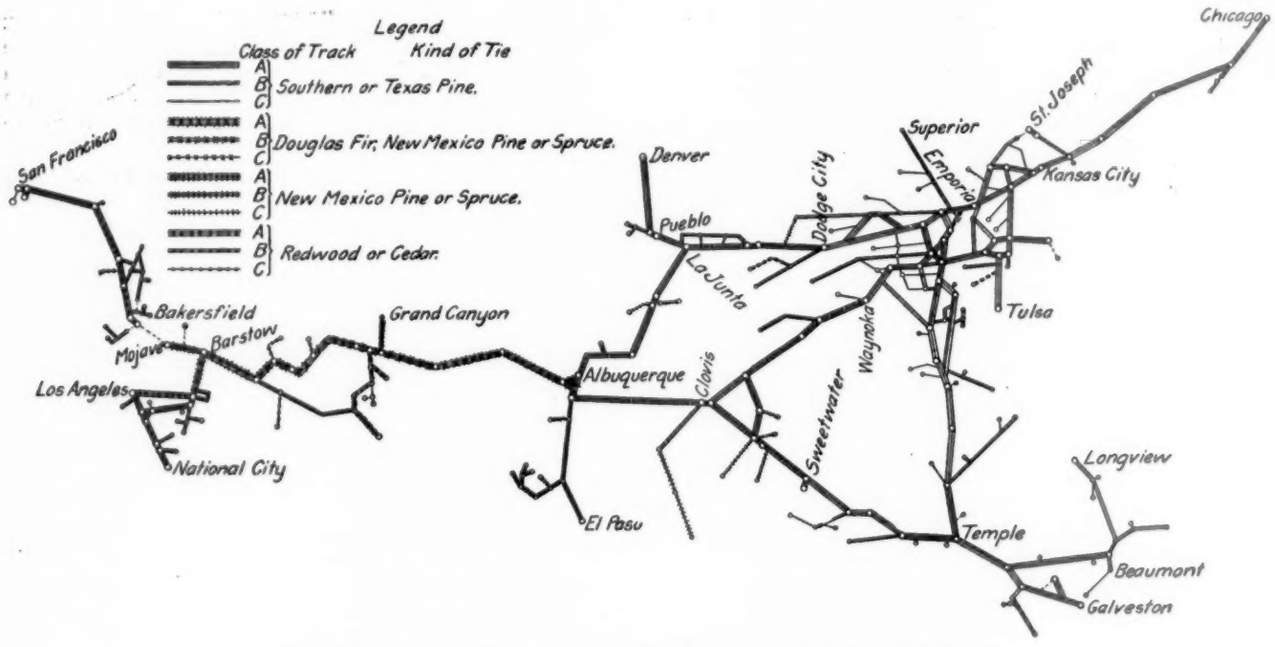
Based upon these conclusions, the following assignment of ties has been determined upon:

For Class A track, No. 1 ties, either hewn or sawed, of 7-in. by 8-in. cross section or larger.

For Class B track, No. 1 ties, either hewn or sawed, of 6-in. by 8-in. cross section or larger.

For Class C track, No. 2 ties, either hewn or sawed. Culls and rejects will not be treated and will be furnished only on special requisitions for use in temporary tracks and in emergencies. Number 2 ties will be used in industrial tracks whenever possible, in order to keep their cost down.

In order to make this plan effective the local officers of each division will make a detailed inspection of all ties in their tracks in the late summer or early fall, from which they will prepare an estimate of the ties required for renewals in the following calendar year, classifying separately the number of ties of each grade and the hardwoods required. These division estimates will be assembled in the general offices, so as to reach the purchasing and stores departments not later than November 1. In filling requisitions, ties will be consigned to the roadmaster, who is held responsible for their use in the localities for which they were ordered. In case the class and size of tie required is not available, the next higher class or size will be substituted.



A Graphic Representation of the Distribution of Ties on the Santa Fe

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THE APACHE TRAIL.—To arouse interest of the public in this great outdoor attraction of Arizona, the Southern Pacific has printed a description of the 120-mile trail trip on its dining car menus to be used during the next few weeks. Sixty thousand copies of these "Apache Trail" menus have been printed. Historical phases of the trail are outlined, as well as the unsurpassed natural beauty to be found in this part of Arizona. Recently the Southern Pacific prepared a series of motion pictures depicting scenes along the Apache Trail, several sets of which were made for exhibition in the east.

Physical Statistics and Economical Operation*

The Difference Between Financial and Physical Statistics—Suggestions for Use of the Latter

By William H. Williams
Chairman of the Board, Wabash Railway

WE HAVE in railroading, as in every other industry, two classes of statistics. There are financial statistics—which may be said to be the language of the accounting and treasury departments and largely of the executive department, and we have physical statistics—which may be said to be the language of the transportation and maintenance departments. The financial results no more than measure the amount of profit of the institutions; they do not measure the efficiency of the men in the various departments. The financial results, when compared with those of like undertakings measure the relative value of the securities as investments; they afford some test of the wisdom of those who conceived the enterprise, whether they made a wise location for their railroads, had the capacity to select and develop men and whether they exercised sound judgment in making capital expenditures. All those things enter into the cost of securing money, that is, the amount that the corporation has to pay for it. But the responsibility for the location of that railroad rests with men who are now dead and gone. And so, as I said before, financial statistics do not today measure the capacity of the present management nor of the present operating staff.

Track

When you come to track, there are four important elements —possibly five—but rail, ties, ballast and drainage are the four important factors in maintaining your track. The financial statistics do not indicate whether or not the track has been maintained. They indicate the expenditures, but they do not indicate what has happened to the property. If you look at the physical statistics you can get some intelligent view of the situation.

What is the number of miles of main track on each division that are maintained with new rail, and what is the weight of the rail? What is the number of miles of track laid with new rail each year for 15 years, and the weight of the rail laid? What is the density of traffic each year? Similar information ought to be secured for the tracks on each division. I make that suggestion because you may be buying sufficient rail to properly maintain the track in its entirety, and yet, through failure properly to apply it, you may be improving the situation on one section of line and letting another division deteriorate, a result that sooner or later adversely affects your traffic. Similar information ought to be secured for each class of track on each division where relayer rail is used.

When you come to the study of ties, there is the question of the number in main tracks, the number in passing tracks, and the number in sidings on each division; the number of each kind of tie, whether hard wood, soft wood treated, soft wood untreated, etc., and the number of soft wood ties with and without tie-plates. The information should show the number that have been laid each year for 15 years. The study of that, together with the prices, will give you some indication of which is the most economical, and whether the present practice is the proper practice.

Of course, a comparison of the number laid with the total mileage of track ought to be considered. You can make similar analyses as to interlockers, on the basis of the number of levers to be maintained, and you can likewise take up other matters which come under the roadway and structures department. But that analysis, particularly with reference to ties, ought to be made for each operating division, for each supervisor's subdivision and for each track foreman's section.

Where the data are not collected in that way, the man who makes the most noise usually gets the most material and is the most wasteful.

Locomotive Repairs

When we go into the shop department, we take up, first, say, the locomotives. You have three general classes of locomotives—passenger, freight and switching, and you have different types and sizes of locomotives. You can today buy locomotives on the basis of weight.

In analyzing shop performance on locomotives, the first step is to ascertain the number of engines of each kind receiving each class of repairs by months, namely, class 1, 2, 3, 4 and 5 repairs, for the past five years, making due allowance for the engines that are scrapped, sold, or withdrawn from service, including in that all engines not making mileage for three months and not actually undergoing repairs during these three months; also making allowance for additions to locomotive stock. Then there should be a statement of engines out of service and not undergoing repairs during the preceding three months, those that are withdrawn and placed in white lead awaiting an increase in traffic and those withdrawn and intended to be scrapped.

For the engines that are repaired, there should be a statement drawn up showing the number, the service to which assigned, the size, the place at which the repairs were made, the class of repairs; also, the shop at which and the date on which the engine previously received class repairs. This statement should also show the average mileage between the former shopping for class 1, 2 or 3 repairs, and the present shopping. The purpose of all this is to measure the efficiency of the repair work as it is being done.

By such analysis one railway found that the locomotives from one of its shops, averaged 56,000 miles between shopping, while the locomotives from its main shop on the system, where they naturally expected the best performance, were averaging only 18,000 miles. A study of that situation developed that the roundhouse people were paying little attention to engines out of the main shop, with the result that when they did get around to making any repairs, these engines had gone so far as to limit the mileage which could be made between shoppings, reducing it from about 56,000 miles to 18,000.

In addition to what I have already suggested, we should ascertain the number of man-hours at each shop on each class of repairs to locomotives, so as to measure the number of man-hours that are being worked on each class of repairs. That will give some idea as to the way in which the men are being handled.

Repairs to Freight Cars

When we take up the question of freight cars, we ought to have an analysis made of the repairs to each class of freight

*Address before the 35th annual meeting of the Railway Accounting Officers Association at Richmond, Va., June 13 to 15.

cars, and separated as between all-steel cars, steel underframe cars and wooden cars.

Were I to criticize the present classification of operating expense accounts, I would direct most attention to repairs to locomotives and repairs to cars.

Repairs to cars are divided into two classes; repairs to freight cars and repairs to passenger cars. Repairs to locomotives are reported merely as "repairs to locomotives." Yet, think of the immense amount of money that is being spent in those three items, and the only information given is the total amount expended for repairs; and think of the very small amount of money that is covered by other accounts that are set up in the classification of accounts.

There is no analysis made in the Interstate Commerce Commission's classification of repairs to locomotives or repairs to cars that is useful to the management of any company in the economical operation of the property, and a further study of these accounts ought to be made. For example, in connection with your car repairs, the information should be classified to show for each of the types of cars: (a) the number of end sills supplied, (b) the number of side sills, (c) the number of center sills, (d) the number of sides renewed, (e) the number of ends renewed, (f) the number of roofs renewed, (g) the number of wheels renewed, and similar information covering trucks, draft gear, couplers, air hose, etc. To the extent that we are using specialties we ought to give consideration to the kinds that are renewed, the dates, and the numbers purchased.

A few years ago I was asked to make an analysis of the coupler situation on one road and I was told that a particular coupler was giving great satisfaction, that the number of breakages in relation to the number purchased was almost nil while there was considerable breakage in the case of the Janney couplers. When I asked for a statement of the number of couplers purchased over a given period, I found that no Janney couplers had been purchased in eight years, and that the particular coupler which was reported to be giving such a good performance had been in existence for the previous two years only. Unless you get such elements in their proper relation, you may get very far away from a proper conclusion.

In freight cars, we ought to show the number out of service undergoing repairs, the number out of service awaiting repairs, the number awaiting repairs one month or less and the number awaiting repairs over one month. That ought to be done for locomotives, too.

In the past, mechanical departments have, in a measure, determined the policies of the companies with regard to equipment, before submitting the matter to the executives. They have failed to report certain types or classes of locomotives or cars until they had gotten in a condition requiring so great expenditures of money as to make their withdrawal from service the only economical thing which could be done.

And yet, if you say to the superintendent of motive power, "We will withdraw from service a given type of car at any time that it requires repairs equal to $150 per car, but will keep the repairs up and keep the car in service until it requires $150 of repairs," you will practically never withdraw those cars from service! It is only through failure to keep up repairs that they allow the equipment to get into such condition as to require $600 to $800 worth of repairs per car, which leaves the management no option except to withdraw the car from service. And yet, generally speaking, I have never seen an accounting department join hands with the management of any company on the situation I have just outlined and get that remedy at any time adopted on any of the roads of the United States.

In connection with your freight car reports, analysis should be made of the M. C. B. repair bills, to ascertain the number of days that your cars are off the home line and on each foreign line, and the amount of the repair bills of each foreign line against your line. Dividing the cars' days into this bill will give you the average cost per day for repairs to your cars on each foreign line. Reverse that operation and ascertain the number of days that cars from each foreign line are on your line, and the amount of repair bills for a year made against each of those foreign lines, and you will ascertain the average daily amount of your repair bill against each of the other lines. This will point out the roads where an investigation of the car repair bills will be worth while. We can make analysis in the same way for passenger cars, but I do not feel that it is necessary to go into details, as a similar practice can be followed.

The Transportation Department

Coming down to the transportation department, the capacity of the track is measured in trains. Trains must be spaced five to 10 minutes apart. As the speed varies the capacity is reduced. It is quite important, therefore, that we handle on each train its full tonnage capacity, because additions to the number of trains necessitate additions to the track capacity, and, of course, beyond that the tonnage that is handled on a train measures the profit that is received from its operation

Your train is made up of locomotives and cars. You can equate the changes in size of locomotives by the thousands of pounds of tractive power. As you go over your cars there is the question of capacity, and the question is presented of the capacity that is utilized in handling a particular class of traffic; and, also, as to each class of traffic, the extent to which the shipper loads that car to its weight or cubic-content carrying capacity.

The importance of that is illustrated in this way: Your engine is hauling the dead weight of the car, it is hauling the paying load and, in addition to that, there is the frictional resistance of each car that is handled. On a three-tenths per cent grade, the frictional resistance would be about 15 tons. So you are handling two constants—the dead weight and the frictional resistance. The paying load is variable. As you increase the paying load up to the capacity of the car, you are very materially increasing the percentage amount of the paying load in the train which one engine can haul.

On one road where an analysis was made recently, the falling off in 1922 as compared with 1920—and I will say that in 1920 we still had the benefit of the co-operation of the shippers which came during the war, when we got the best loading—was such that it required 10 per cent more engines, 10 per cent more cars and 10 per cent more fuel to handle the same tonnage that was handled in 1920. It is just a question of loading the car.

Yet, I should like to ask how many accounting men bring that matter to the attention of the managements of their companies?

Delays to Car Movement

Now, in addition to loading, the economical use of cars is dependent on mileage. To some extent loading is controlled by the tariff provisions as to minimum carload weights, and also by the shipper and consignee. An analysis ought to be made to determine which shippers are persistent abusers of the use of cars from a railroad standpoint, ascertaining the number of cars in each class which have been delayed unduly in loading or unloading. Also, each yardmaster should prepare a statement showing separately northbound and southbound cars, the number in yard six hours or less, the number in yard over six and not over 12 hours, the number in yard over 12 hours and not over 18, the number in yard over 18 hours and not over 24, the number in yard over one day. An analysis of that kind will indicate the yards which are having sluggish movements. Furthermore, it is a psychological fact that within six weeks of the time of putting that char-

acter of report into effect, the average delay in the yards will be cut in two.

When it comes to locomotives, we have the tractive power, and can equate the difference in sizes of the locomotives, using so many pounds of tractive power as giving the capacity of one. The haul is measured by the tractive power. Then you have the tonnage rating, and you have to make allowance for friction, as I have outlined above, and you have a reduction to make for speed and for temperature, high winds, etc. In the quick dispatch of perishable freight, you usually cut down the tonnage of the locomotive 20 to 40 per cent.

After giving consideration to those factors, the question is how near are you to securing 100 per cent from your locomotives on each division and on each set of runs. In connection with this comes the question of turning at the terminals and the number of man-hours per locomotive turned. Prior to the strike it took about five and one-half hours to turn a locomotive; subsequently, it required about eight hours, which meant a loss on the average, of two and one-half hours on each locomotive every time it reached a terminal. I believe we are getting back to normal, but it is quite important to know the average time it takes to turn a locomotive, because it has a material effect on the mileage.

Long Engine Runs

There has come into vogue recently the practice of running an engine through two or more engine terminals. I was on one road recently where a passenger locomotive hauled the train 493 miles without change. The crews were changed en route. That was a coal-burning locomotive. Some other roads are running engines in freight service 400 miles, but they are using oil. That clearly demonstrates that the locomotive is a machine that can be run 400 or 500 miles without receiving the attention incident to turning in a roundhouse. It may have to stop en route to clean its fires, if it is a coal-burning locomotive. We have gotten into the practice of 100 mile terminals simply through force of habit. We are now going around making experiments in another direction which, it seems to me, will add very materially to the use of locomotives, having in mind that every time you turn a locomotive you are losing not less than five and one-half hours, and about a ton and a half of coal.

When you come to the traffic department, how many accounting men have made any analysis that is really worth while to that department, or to the management, in determining whether the road is gaining or losing?

You have the local business coming from the stations on your own line; as to that it is rather easy to learn in a general way from the loading statements, whether you are gaining or losing, and to point out the class of traffic in which the gain or loss occurs. In the same way, why cannot you take the interline reports and analyze them to show the amount of traffic coming from different railroads of the United States or destined to those various railroads, both with respect to the volume and the class of traffic and how it compares with other years over a given period?

We have statements of the gross tons that are handled, the tons handled one mile of the traffic loaded locally and of the traffic received in interchange. But the interchange is unclassified. There is no analysis except as to the immediate connections. There is no analysis showing where that traffic originates, or where it is destined, or to what extent we are getting out of the situation what there is in it.

We might analyze the O. S. & D. reports to see the extent to which reports are made against each station for loading—local and foreign. That will point out the places where there is carelessness in loading cars. That can be supplemented by having photographs taken as the car is broken open at the destination station, or at the place where the damage is located.

We ought also to make an analysis of the increase or decrease in material costs which is due to the number of units of material and to make a similar analysis of the increase or decrease in material costs due to change in prices. In like manner we ought to make an analysis of the increase and decrease in labor due to the number of man-hours in each class of work, and we ought to show wages as divided between the regular and the extra allowances, and analyze the extra allowances.

Statistics Should Extend Over Sufficient Period of Time

Generally speaking in making our comparisons, we make them with the preceding month and with the corresponding month of the preceding year. It is seldom that we find that our statistics extend over a sufficient period of time to indicate the trend. The important question is—are we gaining or are we losing? We should undertake to state our statistics for 10-year periods. That gives us something which will enable every man to see the direction in which we are going.

Take, for example, locomotives: Make an analysis of the aggregate and average tractive power of your locomotives in freight and in passenger service as compared with the aggregate and average tractive power 10 years ago or 20 years ago. Has the increase in freight train loading kept pace with the increase in the average tractive power of freight locomotives? Has the loading of freight cars of each class increased correspondingly with the increase in capacity of each class of freight cars?

A statement should be made of the earnings of cars by classes. It need not be exact, but it should be approximately so. What are the earnings per year of box cars or refrigerator cars, of open top cars, of flat cars and of stock cars, etc.? I have had an analysis of that kind made on a number of roads. Generally speaking, it has resulted in the purchase of cars of a different type from that first recommended by the operating department.

Further, an analysis should be made of the reports of the car service department on the shortages of cars at each point on the line. Is it a seasonal shortage, is it one that goes on throughout the year, and for what type of car and what class of traffic?

Generally speaking, when we undertake to buy cars, we look at our per diem balances and give consideration to buying enough cars to offset the per diem balances. But we ought to take into account the loss of traffic that is due to the failure to furnish cars to supply the reasonable demand throughout the year.

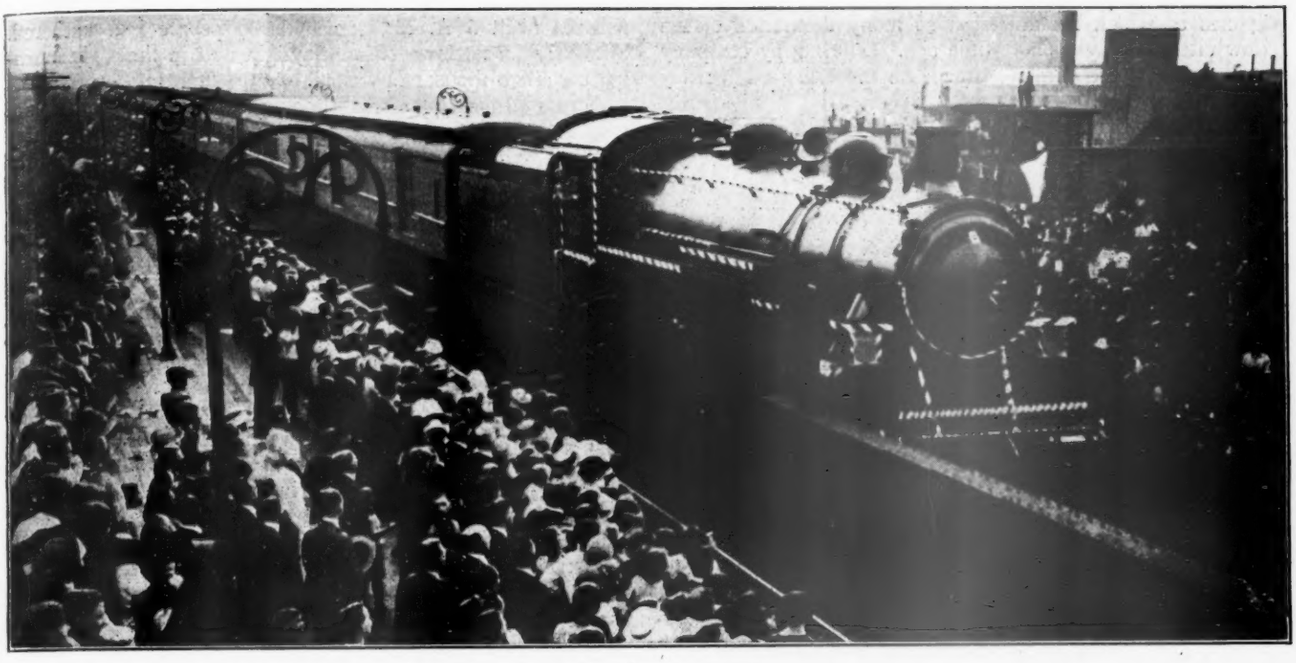
I do not know how far these thoughts have interested you. I have endeavored to present them as suggesting or indicating some of the variable factors in the different departments of railroading, in the hope that you will endeavor to understand the problems of those departments and to speak their language, which will bring about that mutual confidence that is essential to successful operations.

THE CHICAGO, ROCK ISLAND & PACIFIC has put into effect a plan whereby an employee entering the mechanical forces will be given personal instruction concerning his duties and the work which he will do. Under the plan each new apprentice entering the shop forces is examined to determine his special qualifications for certain work and is given instruction by a mechanic until he learns the general principles. This instruction is followed by technical training for special work to which he is finally assigned. Classes are now being conducted at Silvis, Ill., and similar classes are being organized at other points. The instruction is designed to develop a higher grade of mechanic and to remove the difficulty which now exists when an employee is placed in a position and left to work out his own salvation without proper instruction.

N. Y. Times Wide World Photos

President Harding's Last Official Act—the Formal Opening of the Alaska Railroad

Upper Left—Leaving Special Train for Rail-Motor Trip over a Branch Line. Upper Right—In Locomotive Cab at Wasilla. Center—Driving the Golden Spike Completing the Railroad. Lower Left—President Harding Leaving Special Train at Aircharge. Lower Right—Group at Tanana Bridge While President Harding Was Driving the Golden Spike.



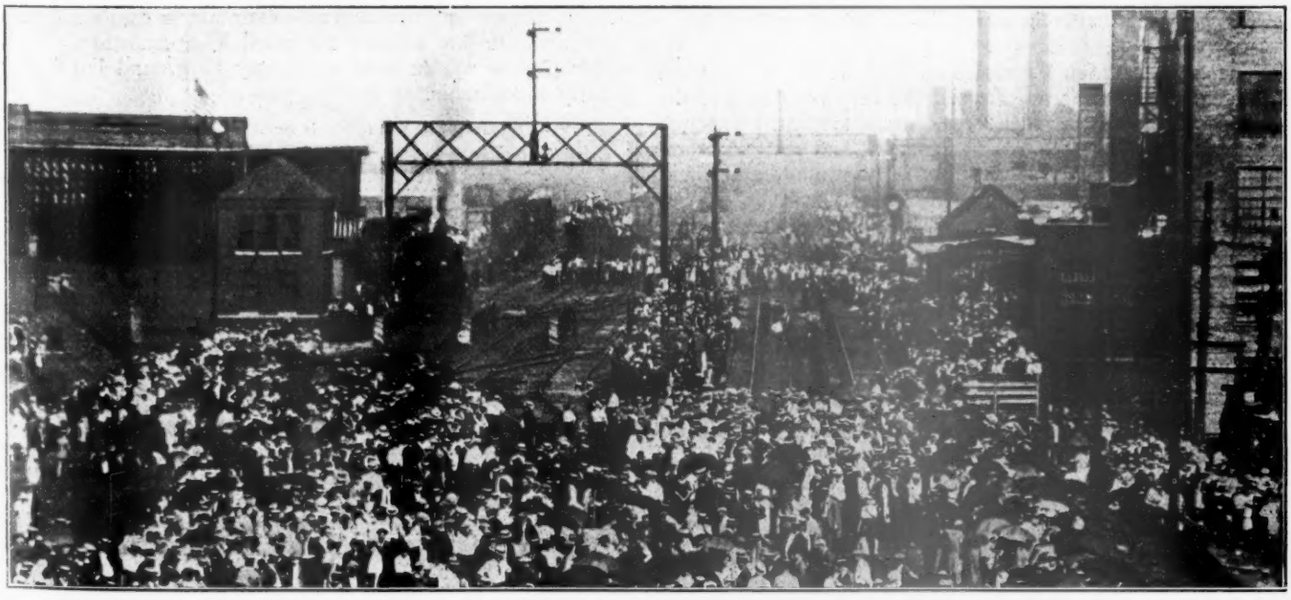
Special Train Arriving at Kedzie Ave. Station (C. & N. W.), Chicago

Memorable Journey of the Harding Funeral Train

Millions Bare Their Heads as Transcontinental Special Bearing His Body Passes

THE TRIP of the special train which bore the body of President Harding from San Francisco will probably go down in history as the most remarkable ever made on this continent. Never before have the newspapers printed as many details regarding the movement of a train and never before have the American people followed so closely and so reverently from hour to hour the reports of the progress of a train. Never before have the people lined the tracks in such numbers—not in mere curiosity nor to hear a famous speaker, but simply to bow their heads in reverent tribute to their late Chief Executive.

The special train which bore the President's body was the same that had carried him, his wife, government officers and newspaper correspondents on the triumphant journey across the country several weeks before. The private car "Superb," where his body lay in state, was the same one from the rear



A Portion of One of the Crowds in Chicago

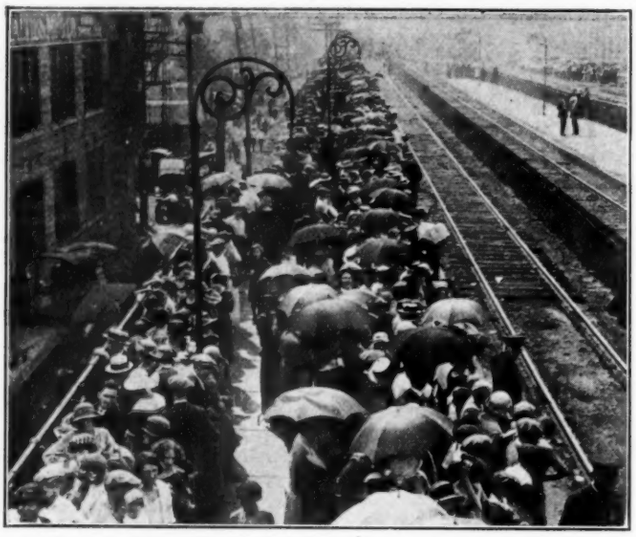
platform of which he addressed so many thousands of his fellow citizens only a short time ago. The happy company which accompanied him westward, on the eastward journey were his mourners.

The tentative schedule outlined for the funeral train was as follows:

Leaving San Francisco	Aug. 3, 7.00 P. M.
Arriving Ogden	Aug. 4, 9.05 P. M.
Arriving Omaha	Aug. 6, 2.15 A. M.
Arriving Chicago	Aug. 6, 3.30 P. M.
Arriving Washington	Aug. 7, 1.30 P. M.

The train was routed over the Southern Pacific, the Union Pacific, the Chicago & North Western and the Baltimore & Ohio.

The train could not keep up with the tentative schedule, however, principally because of the enormous crowds which came out to view its passage and the practice of running very slowly through these crowds. The result was that the train did not arrive at the capital until 10:25 P. M. on August 7—almost nine hours late. Considering the frequency of these periods of slow speed, however, and particularly the exceptionally slow progress through Chicago, where, it is estimated, 300,000 people lined the tracks to do homage to their departed President, the train made remarkably good time.



Waiting for the Train at a Chicago Suburban Station

The train left San Francisco at 7:15 P. M., 15 minutes behind the tentative schedule. At the very beginning of the trip the nature of its journey was made evident. Through the night as well as the day in the small and scattered communities in the Far West virtually all the inhabitants lined the station platforms waiting with bared heads, ex-soldiers at attention, for the train to pass. As the train arrived at Reno, Nev., on August 4, shortly before 6 A. M., bells were tolled and an official delegation of state and municipal officers visited the train with floral offerings. As the train moved eastward through more populous districts, the gatherings at the stations became larger. At any point where a stop was necessary for changing engines, military and patriotic organizations and bands were drawn up and at almost every opportunity floral offerings were brought forward—so many that finally the President's secretary, George B. Christian, had to refuse further such offerings because of lack of space for them in the train.

At Chappell, Neb., the locomotive which was pulling the train slipped a tire which necessitated some delay in securing another locomotive and shortly thereafter a storm slowed up its progress somewhat. Consequently it left Grand Island, Neb., an hour and a half late. At Omaha, which was not reached until 3 A. M., some 40,000 people had gathered. Similarly across Iowa before daylight and in the early morning the silent thousands waited.

Across Illinois there was almost a solid line of people, not only in the cities and towns but in the fields and country roads as well. Through the many miles of the route the train took through Chicago the platforms and tracks were crowded with hundreds of thousands of people. This, of course, delayed the train, as did hot boxes on two of the cars, so that it did not leave Chicago until 9:30 P. M., instead of 3:30 as contemplated in the first tentative schedule.

Strenuous efforts were made to make up some of the lost time by running fast through Indiana and Ohio during the night. Although some increase in speed was possible by this means, in many places the train had to run slowly simply for the safety of the throngs about the tracks. The presence of such enormous crowds of people was all the more remarkable because the lateness of the train made them wait for hours before it passed. Through the industrial region of Eastern Ohio and Western Pennsylvania greater crowds necessitated miles and miles of slow speed and it was not until 10:25 P. M., eight hours and 25 minutes later than the schedule, that the train ended its sad journey at the Union Station, Washington—a journey to be taken up again on August 8, when the body was borne away from Washington to its final resting place at Marion, Ohio.

A High Carbon Welding Metal

Welding has proven its value in railroad applications not only in maintenance, construction and repairs but also as a reclamation medium particularly on low carbon steel parts. The reclaiming and maintenance of high carbon steel parts such as buffer castings, frog points, steel tires, etc., have somewhat suffered due to the fact that a suitable welding metal was not generally available.

The Page Steel & Wire Company, Bridgeport, Conn., has perfected a welding metal, the carbon analysis of which is practically 1 per cent, for welding high carbon parts by either the oxyacetylene or electric arc welding process.

The principal application of Page high carbon welding rods and electrodes is for the building up of worn surfaces where a high resistance to abrasive wear is desired. In electric arc welding this electrode maintains a stable and uniform arc. In gas welding the metal flows smoothly. With either process the finished weld may be ground but is not readily machinable.

Tests of Weld Deposits on .42 Carbon Steel

Original metal—		
Carbon		.42
Scleroscope		35
Two layers of weld metal—	Carbon	Scleroscope
Outer surface of deposit	.63	38
At a depth of 1/16 in. from top	.56	37
At a depth of 1/8 in. from top	.57	33
At a depth of 3/16 in. from top	.46	34

The table shows a typical result of weld deposits when made on a steel of .42 carbon content indicating wearing qualities that are even more than equal to the original material.

During the two years in which reports have been made to the Highway Safety committee of the Public Safety division of the Chicago Safety Council, 785 instances of carelessness exhibited by motorists in crossing tracks of steam and electric railroads have been reported by gatemen and flagmen in Chicago and vicinity. Of this number 195, or 24.8 per cent, are cases where damage has occurred to crossing protection equipment.

T. H. Beacom Made Receiver for D. & R. G. W.

Former Vice-President and General Manager of Rock Island Succeeds J. H. Young on Western Road

T. H. Beacom, until recently vice-president and general manager of the Chicago, Rock Island & Pacific, has been appointed receiver of the Denver & Rio Grande Western, succeeding Joseph H. Young, who has resigned because of differences of opinion with financiers representing the security owners of the road regarding the measures necessary for its rehabilitation.

Mr. Young, the retiring receiver, had been connected with the property only slightly over two years and has a long record as a successful railway officer. He was formerly general superintendent of the Southern Pacific and became president of the Guggenheim railway and steamship interests in Alaska in 1910. In 1912 he became president of the Spokane, Portland & Seattle and other Hill lines in Oregon and Washington. Later he was president of the Norfolk Southern and in 1919 he became senior assistant director of operation of the United States Railroad Administration. He had returned to the Norfolk Southern as president when early in 1921 he was tendered the presidency of the Denver & Rio Grande, of which he subsequently became receiver. During his entire connection with the Denver & Rio Grande Western there was clashing of financial interests which rendered it impossible for him to do constructive work.

T. H. Beacom

In assuming charge of this property, Mr. Beacom faces a difficult task. The road has been in financial straits for a number of years. It has also suffered from acute differences of opinion between various financial interests as a result of which it has not been possible to agree upon the program of improvements necessary to bring the property up to a condition enabling it to compete with other roads for through business. For the same reason, it has not been able to serve adequately the shippers who are dependent solely upon it for service and there is much hostility among them to be overcome.

Originally a part of the Gould system, the credit of the Denver & Rio Grande was pledged for the construction of the Western Pacific. With the breaking down of the Gould program for a transcontinental railway system and the failure of the Western Pacific to earn its fixed charges, the Denver & Rio Grande was forced into receivership on January 25, 1918. Interests controlling the Western Pacific purchased the property at a judgment sale on November 20, 1920, and the road was removed from receivership and reorganized as the Denver & Rio Grande Western on August 1, 1921. However the road soon defaulted in payment on mortgage bonds and was again thrown into receivership on July 21, 1922.

Since that time there has been a constant clash among the interests seeking control of the road which resulted a short time ago in Mr. Young tendering his resignation. A reorganization plan has been announced and at present is receiving consideration, which provides for the joint ownership of the Denver & Rio Grande Western by the Missouri Pacific and the Western Pacific. Approval of this plan, which would again establish that part of the transcontinental line of the old Gould system between St. Louis and the Pacific coast, is expected to be asked of the Interstate Commerce Commission soon.

Entirely aside from its financial condition, the Denver & Rio Grande Western is a difficult property to operate, crossing the heart of the continental divide with gradients and summits less favorable than those of its competitors. The road is further handicapped with a large mileage of branch lines many of which are narrow gage. It needs the expenditure of large sums for improvements, particularly for bank widening, for ballasting, for additional rail, for improved engine terminals and other facilities which will reduce the cost of operation.

Mr. Beacom brings to this road a long experience in the operation of western railways. His training has been in the transportation department where he has been unusually successful in the handling of traffic with limited facilities. He has also demonstrated a marked aptitude for making friends and holding them and for his ability to present the railway viewpoint to the public, which trait was shown in a striking manner when he was manager of the Second District of the Rock Island in charge of the lines of that road in Kansas, Oklahoma, Arkansas and Texas, a territory which was particularly hostile to the railways a decade ago. While in this position, Mr. Beacom was unusually successful in reducing the spirit of antagonism and in making friends for the road. He has also been popular with the employees, a characteristic which will be called into play on the Denver & Rio Grande Western where there have been numerous difficulties.

Thomas H. Beacom was born on November 23, 1866, in Jones county, Iowa. He first entered railway employ as a timekeeper in a construction gang on the Chicago, Milwaukee & St. Paul in 1882 at the age of 16 years. In two years he was advanced to check clerk and ticket clerk. In 1884 he entered train service as a brakeman, and in three years was promoted to conductor. In the five years in which he

held this position, Mr. Beacom established such a record for efficiency that he was presented with a testimonial of his ability by his division superintendent. He was promoted to general yardmaster in 1893 and held this position until August, 1902, when he left the service of the St. Paul to become a trainmaster on the Iowa and Illinois divisions of the Chicago, Rock Island & Pacific. Two years later he was promoted to division superintendent of the Oklahoma division. From February, 1904, to December, 1909, Mr. Beacom was transferred consecutively to the St. Louis, Kansas, Panhandle, Oklahoma and Missouri divisions. He was promoted to general superintendent of the Third District in December, 1909, and in February, 1912, was promoted to assistant general manager, with headquarters at El Reno, Okla. He was transferred to the First District, with headquarters at Des Moines, Iowa, on April 1, 1913. On January 1 of the following year, he was promoted to general manager of the Second and Third districts, with headquarters again at El Reno. During federal control, Mr. Beacom was appointed general manager of the Rock Island system and upon the return of the carriers to their owners on March 1, 1920, he was elected vice-president and general manager, with headquarters at Chicago. In April of this year, Mr. Beacom resigned from the Rock Island service as a result of disagreement in policies. His appointment as receiver for the Denver & Rio Grande Western marks his return to active railroad duty.

New President Appreciates Need of Adequate Transportation

WASHINGTON, D. C.

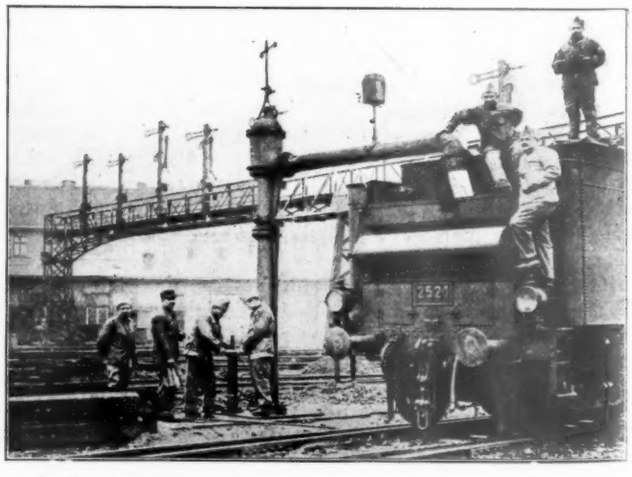
WHILE it is undoubtedly too early to attempt any forecast as to the probable effect on the railroad situation and prospects for railroad legislation at the next session of Congress of the passing of President Harding and the succession of Calvin Coolidge to the presidency, those who have been familiar with the views of the new chief executive and with his career in Massachusetts are confident that his attitude toward the various transportation problems will be a constructive one.

Beyond a general announcement of his intention of carrying out the policies of the late President Mr. Coolidge has withheld any expression of his attitude as to particular problems facing the country until after the funeral services and he has not recently in any of his speeches or writings given any definite indication of the views he might be expected to hold with reference to the specific features of the various controversies involved in current discussion of what ought to be the nation's transportation policy. As governor of Massachusetts he was naturally in close touch with the transportation problem of New England and he is understood to have given considerable thought and to have gained much accurate information as to transportation questions in general. As Vice-President Mr. Coolidge was invited by President Harding to participate in Cabinet meetings and he, together with Secretary Hoover, is credited with having brought various phases of the transportation question to the attention of such meetings and perhaps more directly to the attention of the President at other times during the past two years. While the position he has taken himself on such occasions has not been made a matter of public information it is the understanding of those who have been in touch with the discussions in administration circles that his attitude has always been one of appreciation of the paramount importance to the welfare of the country of maintaining an adequate transportation system and of the fact that a constructive rather than a repressive and restrictive policy on the part of the government authorities is vitally necessary to that end.

This was President Harding's own attitude and although he began early in his administration to try to bring about general reductions in railway rates he became convinced after a more careful study of the subject that an insistence on drastic action in this direction would be disastrous in its effect on the efficiency of the railroads. In his Kansas City speech President Harding said that the "prosperity of the railroads is the prosperity of the American people" and that he did not share the views "of those who would lower rates without regard to railroad good fortune." President Coolidge is believed to hold this same general attitude but he has not yet indicated just what position he may be expected to take with reference to proposed amendments to the transportation act relating to consolidations, labor disputes, state rights, etc. Many applications to the railroad question may perhaps be drawn, however, from the following extract from his first inaugural address as governor of the Commonwealth of Massachusetts:

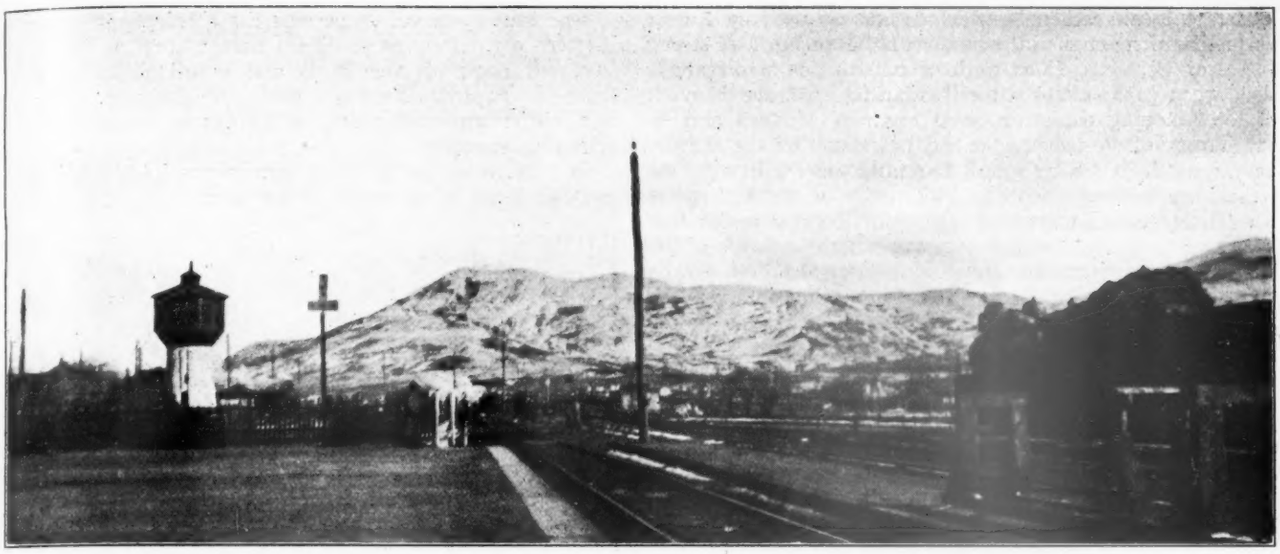
"Expect to be called a standpatter but don't be a standpatter. Expect to be called a demagogue but don't be a demagogue. Don't hesitate to be as revolutionary as science. Don't hesitate to be as reactionary as the multiplication table. Don't expect to build up the weak by pulling down the strong. Don't hurry to legislate. Give administration a chance to catch up with legislation."

Those who have talked with the new President during the past few days have been quoted as believing that he is not likely to be impressed by the demand in some quarters for a special session of Congress. It is also stated that he expects to give attention to domestic problems in precedence over those of an international nature. One of these is the threatened danger of a strike in the anthracite coal mines and while the situation involved is somewhat more complicated than that presented by the Boston police strike, which he handled so successfully by taking the firm position that "there is no right to strike against the public safety, by anybody, anywhere, any time," there appears to be a good deal of confidence in his ability to deal with a situation affecting the public necessity in general so vitally as would a suspension of coal mining. One of his first conferences is understood to have been on this subject and the United States Coal Commission has since come out with a recommendation that the President should have the right by law to prevent a general strike.



Underwood & Underwood

French Railway Men in Military Service on Duty in Ruhr



Jemienpo Station, Showing Water Tank

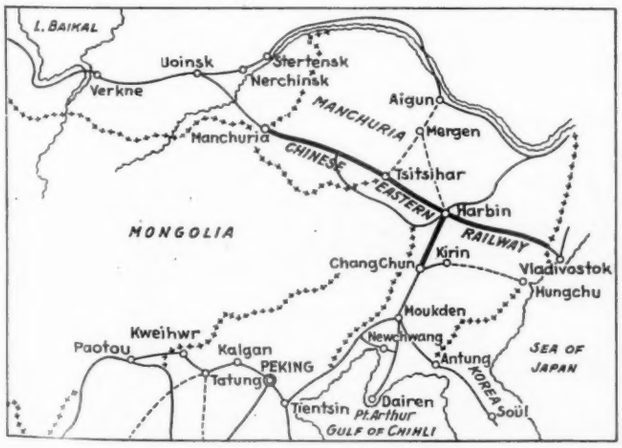
Imperialism, Intrigue and the Chinese Eastern

Road Now Breaking Even Under Franco-Chinese Control —Celebrates Twenty-Fifth Anniversary

By Railway Age's Correspondent in China

PEKING.

ON JUNE 11 the Chinese Eastern Railway Administration celebrated with appropriate ceremonies the twenty-fifth anniversary of breaking ground for the first construction. Conceived in imperialism and born of intrigue, this railway has experienced a generation of violence



The Chinese Eastern Railway

and change whose dramatic interest is exceeded only by its international importance.

Imperialism of 25 Years Ago

Russia had pushed the Trans-Siberian railway almost to the borders of Manchuria when Japan went to war with China, defeated her and forced the cession of the Liaotung peninsula—at the tip of which is Port Arthur. Russia professed to take alarm, formed a combination with France and Germany which forced Japan to take a monetary compensation instead of the Liaotung peninsula, arranged with French banks to advance the money, formed an alliance with China against Japan and secured in return the privilege of building the Trans-Siberian railway directly across Chinese territory to Vladivostok. Count Witte's "Memoirs" indicate that a very clear personal understanding existed between the Russian Czar and the German Emperor for, almost as by a concerted movement, while Germany seized Kiaochau Bay, the Russian fleet occupied Port Arthur, thus seizing from China the territory which Japan had been forced to re-

Chita Express at Manchuli on the Chinese Eastern

trocede. This procedure was regularized by a lease which carried with it the privilege of building a branch line from the Trans-Siberian line to Port Arthur. These acts formed the principal basis for Chinese opposition to foreign capital which has existed ever since.

The work of construction was only well begun when the

Boxer outbreak occurred—which event was used by Russia as justification for the introduction into Manchuria of strong forces of Cossacks. The work of construction was scarcely done when Japan attacked the Russian forces, drove them out of the Liaotung peninsula, even north of Mukden and by the Treaty of Portsmouth gained possession of the railway as far north as Changchun. For nine years following the Russian government had the opportunity of developing the line along normal ways and then came the war in Europe. Three years of war brought in succession the collapse of the Russian government, the Horvath dictatorship in the railway zone, the Koltchak regime, the Inter-Allied intervention, the collapse of rouble currency and a reorganization of the administration of the railway.

Organization and Control

Li Hung Chang, the Chinese premier with whom the Russian government negotiated the agreement for the construction of the Chinese Eastern, refused to allow the construc-

Home of the General Manager of the Chinese Eastern at Harbin, Manchuria

tion of the railway by the Russian government direct. So the agreement for the construction and operation of the line was made with the Russo-Chinese bank—afterward merged with others into the Russo-Asiatic bank. This agreement provided for the formation of a "Chinese Eastern Railway Company" whose shares were to be held only by Russians and Chinese. The Russian government is supposed to have acquired all of the shares. The shareholders elected a board of directors of which the Chinese appointed the president. But as the board of directors met in Petrograd and the president resided in Peking, the latter had little influence on events and after 1900 the office of president was left unfilled, until recent events brought about active Chinese participation in the affairs of the line. The board of directors entrusted a "manager of the railway with the direct administration of the exploitation of the railway and the works connected therewith." As the company had the right to procure lands not only for the construction of the line, but also for its protection and as all Russians in China had the benefit of extra-territoriality, in recognition of which the statutes of the company put upon it the duty of police administration, "the works connected therewith" became a highly important phase of the situation.

The railway therefore became the chief administrator of the territory. It owns the great timber areas adjoining the line. It owns all the lands and buildings in the cities touched. It provides schools, parks and churches. Funerals and christening expenses are recognized accounts under operating expenses.

In 1918, when the Kerensky government had broken down and the board of directors in Petrograd could function no

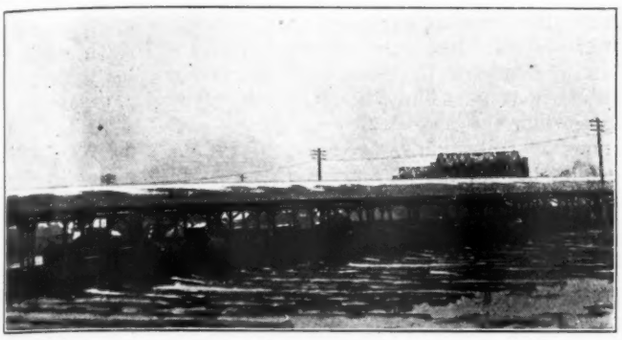
A Fortified Station

longer, the manager of the Chinese Eastern attempted to form a dictatorship for Eastern Siberia. The Chinese authorities then began to understand that the railway and its properties was likely to become the personal adjunct of the officers and employees of the railway. With characteristic deliberation, however, they did not move rapidly enough to prevent the line from falling into such a condition that foreign nations conceived it their duty to intervene. This intervention took the form of military occupation and operation of the line, ostensibly to relieve certain Czecho-Slovak prisoners and preserve the trade interests of all nations, but in

Russian Type Freight Locomotive

reality to prevent Japan from seizing the whole territory. In 1920 the Chinese military forces definitely assumed responsibility for order along the line, disarmed the Russian railway police, threatened certain malcontents among the workmen with instant replacement by Chinese artisans and created something of an atmosphere of stability. These actions created the impression that China was about to seize the railway itself, whereupon the Russo-Asiatic bank, with the support of the French government, claimed to have technical possession of the railway on the ground that the Russian government had deposited all of the shares of the railway with the Petrograd branch of the said bank. Naturally the bank could not produce the shares under these conditions but it could produce witnesses who made affidavits to having seen the shares in the custody of the Petrograd

bank. This claim it suited the Chinese government to admit in part, but the protection of the line was so obviously in Chinese hands (unless Japan decided to seize Manchuria entirely) that the bank compromised by making an agreement with the Chinese Ministry of Communications whereby



Transfer Sheds at Changchun Where the Chinese Eastern Connects with the South Manchurian

the latter is placed in the position of a shareholder ranking equally with the bank. This agreement is to run "pending an agreement which the Chinese government will come to with the Russian government recognized by China regarding the Chinese Eastern Railway." This agreement allows the Chinese government to appoint the president and four other members of the board of directors (in other words equal representation) but no action is binding unless approved by at least seven members.

Article 7 of this agreement provides that "the statutes of the Chinese Eastern Railway Company which do not conflict with the clauses of the present temporary agreement remain in force as a matter of course." As these statutes were framed at the instance of the Czarist government at a time when the board of directors sat at Petrograd, naturally they made the general manager practically a dictator in the railway zone. The powers of this general manager can not be changed now except by the consent of at least two of the directors appointed by the Russo-Asiatic Bank, which selects the general manager. Therefore, the Chinese control over the operation of the railway is limited to those matters which must be reported to the board of directors—and there a deadlock is easily created.

At the Washington conference it was proposed to entrust the real management of this line to an international finance committee, but the Chinese representatives would not consent to this plan. The conference then adopted a resolution reserving "the right hereafter to insist upon the responsibility of China toward the stockholders, bondholders and creditors of the Chinese Eastern Railway Company, * * * and the obligations which they deem to be in the nature of a trust resulting from the exercise of power by the Chinese government over the possession and administration of the road."

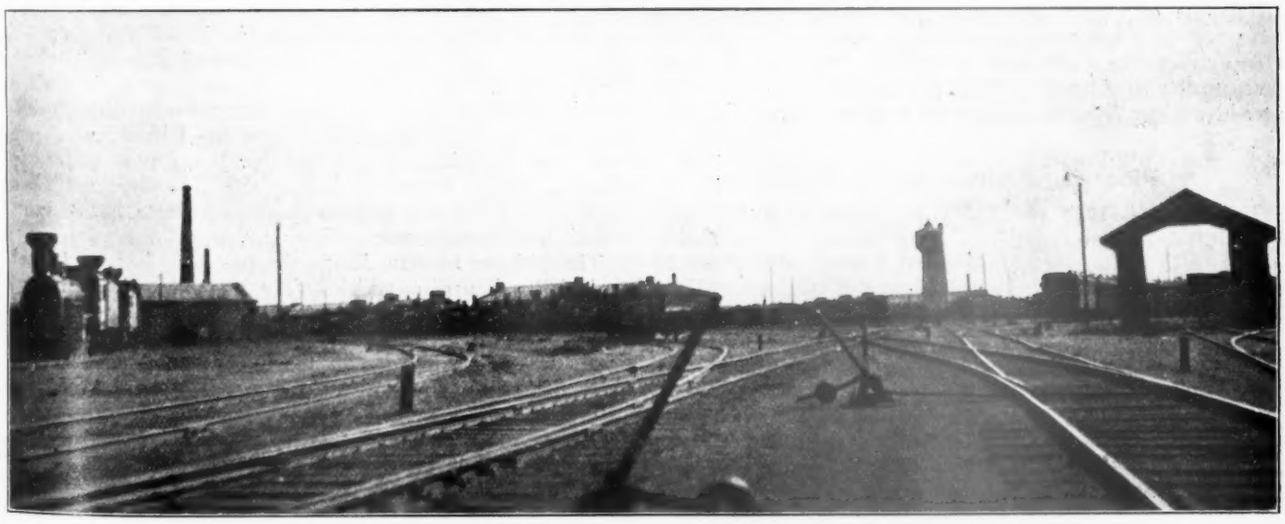
China now finds herself associated with a partner who is not an owner of the property but who has a greater degree of control than herself. Though the bank claims to be Russian it flies the French flag and claims French protection. Though it has the control over the railway administration no Washington conference resolution puts any responsibility upon it. It charges 18 per cent on advances to the railway and if anyone ever should object, the Chinese government is responsible. This situation has led to the appointment of a commission consisting of the American adviser to the Chinese Ministry of Communications, the Belgian assistant chief accountant of the Peking-Hankow Railway, the Chinese assistant chief accountant of the Peking-Mukden Railway and a representative of Chang Tso-lin, the "supertuchun" of Manchuria to examine the accounts and the financial standing of the line.

Operating Results

The report of the above commission for the most part is of a confidential nature. However some of the results have been made accessible. Members of the commission report the rolling stock of the line to be in good condition, schedules maintained, station buildings and grounds clean and freshly painted and a general air of good discipline. The improvement over 1920 conditions is remarkable. But the most interesting feature of the report is a comparison of operating costs between the Chinese Eastern and a similar length of Chinese government railway line.

For purposes of the comparison the Peking-Suiyuan and the Peking-Hankow lines have been selected as affording a comparable basis as to length, amount of traffic and operating difficulties, and for the additional reason that these lines are under complete Chinese control. For purposes of convenience these two lines as combined will be referred to as the Hankow-Suiyuan line. In the statement which follows, the Chinese Eastern accounts have been re-classified to correspond with the Chinese government classification, except in two particulars, with respect to which it was simpler to make the adjustment in the Hankow-Suiyuan accounts.

It will be noted that the Hankow-Suiyuan line is ap-



Shop Yard at Harbin—Locomotive at Right Is One of Fifty-five Serviceable Stored

preciably longer and carries a third more traffic than the Chinese Eastern, yet its costs are only 60 per cent as great. The Chinese Eastern has frost and snow to content with which the other line escapes, yet it is not under maintenance of way where the Chinese Eastern suffers in the comparison. The departments which suffer the most in this comparison are those of operation and of maintenance of equipment. A portion of the larger expense for maintenance of equipment is explained by deferred maintenance falling in 1922 and a portion by the superior condition of the equipment as compared with the Hankow-Suiyuan rolling stock. The higher expense under operating is explained by the use of wood and Fushun coal as fuel. On a considerable portion of the line Fushun coal at 16 roubles per ton is considered economical in comparison with wood. The Manchurian forests have been cut far back from the railway.

Item	Hankow-Suiyuan line (1921)	Chinese Eastern (1922)
Kilometres of line	1,806	1,726
Total transportation units (millions) (ton kms. plus passenger kms.)	2,253	1,537
	Chinese dollars	Gold roubles
Total operating revenues	30,670,000	36,127,000
Total operating expenses	14,667,000	24,903,000
Operating ratio	48	69
General—		
Administration	1,961,000	2,909,000
Special	1,997,000	2,202,000
Traffic	1,896,000	2,419,000
Operating—		
Locomotive	2,207,000	4,714,000
Freight and passenger car	223,000	589,000
Train crews and train supplies	475,000	600,000
Flotilla	52,000	.....
Maintenance of equipment	3,094,000	4,303,000
Maintenance of way—		
Engineering	4,251,000	4,181,000
Other departments	180,000	456,000
Undistributed	.....	2,530,000
	16,315,000	
Less—		
Carriage of service stores	748,000	.....
Depreciation on rolling stock	900,000	.....
	14,667,000	24,903,000

(The Chinese dollar and the gold rouble are almost exact equivalents, i. e., $0.50, in U. S. money.

But the Peking-Hankow and the Peking-Suiyuan lines have certainly not been considered as models of efficiency. Hence when the Chinese Eastern has explained its costs down to the same basis as those of the other lines, it has not proved a clear title to a claim of modern commercial efficiency.

Financial Position of the Line

During 1918, 1919 and 1920 the railway protected itself from loss in revenue first by raising its rates as the rouble fell in gold value. Later, it fixed day by day rates of equivalence at which it accepted Romanoff, Kerensky, Horvath or Siberian roubles in lieu of gold. The result was that at the beginning of 1921 it found itself with its vaults full of paper money absolutely without exchange value. A gradual introduction of the metallic currency had been adopted in 1920, but during the entire year 1921 collections were entirely on the basis of gold roubles—yen and Chinese dollars being the actual medium. The gold rouble is merely an exchange unit.

Being bare of actual cash for working funds, the device of selling "tariff roubles" was adopted. "Tariff roubles" are credits for transportation service which can be drawn upon by writing checks which will be accepted by the railway. When the railway is in straits for funds the temptation to use the printing press freely is very great. The problem of limiting the issues of tariff roubles so as not to curtail too much the actual cash collections on the railway, and the task of maintaining confidence so that these "tariff roubles" will sell at par requires skillful handling. At the present moment these tariffs are selling slightly above par—the explanation of which unusual phenomenon would require too much space to be given here.

Another difficulty which the Chinese Eastern has had to face is that caused by the assumption of the obligations of the Russian government with respect to the pension system and the provident funds of the employees. These two institutions had turned over to the Ministry of Finance of Russia more than 8,000,000 roubles. The present administration, in its efforts toward efficiency has dismissed several hundreds of employees. But every dismissal carries with it the obligation to refund to the employee his accumulations under the provident fund. Thus the greater the attempt to save money the greater the necessity to find ready cash. This has put upon the railway the necessity of finding some 3,000,000 roubles beyond the normal requirements of the line during the past two years.

Up to the collapse of the Russian government, the Chinese Eastern had invariably earned a deficit. The balance sheet for 1916 shows an accumulated deficit of 183,000,000 roubles lost in 13 years. The record for 1922 shows that the line almost "broke even." The railroad itself would show a comfortable profit, even after allowing for the revenue from hauling Chinese troops which is merely a bookkeeping item for the present. But the railway also had to pay for the policing of the zone, supplies are requisitioned by the frontier defense troops, about 3,000,000 roubles were spent for improvements, about two millions go into official salaries for the administration of the zone. And so at the end of the year the treasury of the railway is about where it was at the beginning. But at least this is some 10 or 15 million roubles better than during the old regime. Naturally, the transformation of a state-fed institution into a self-sustaining industry is not effected without some friction and the engendering of much bitterness.

Favorable Prospects for the Future

Although the former profitable through traffic with the Trans-Siberian railway has been cut off, the freight and passenger traffic have been developed to a point higher than ever before. Manchuria is developing rapidly, and Harbin is a magic city. There are signs of a statesmanlike policy on the part of the ruler of Manchuria, in addition to which sanity seems to be returning to the rulers of Siberia. Through traffic with the Ussuri Railway into Vladivostok is effected with interchange of rolling stock. On the west through connections have been arranged so that the China mails from and for England and the Continent are now going via Siberia. Silver money is current and if it were not for a prohibitive protective tariff over the border, a considerable transit traffic would soon spring up.

The Chinese Eastern during the past year has abandoned the old Russian policy which built a rate mountain at Changchun, and thus forced practically all traffic to flow to Vladivostok rather than to Dairen. The level grades on the southern line compared with the mountainous conditions in the Vladivostok direction make it economical for the railway to deliver a considerable portion of its traffic to the South Manchurian line rather than to the Ussuri. This new policy has brought an immediate response in additional traffic which promises well for the future of the line—unless the old Russian imperialist policy should be resumed.

Prices of materials which the railway must consume have been lowered considerably, partly by the trend of the world market and partly because the improvement in the railway's credit permitted of more efficient methods of purchasing. In fact, the major portion of the saving in expenses effected in 1922 compared with 1921 was due to this cause. However, fuel consumption for the same amount of traffic was reduced by about 15 per cent. This large saving was brought about in part by the use of American-built superheated locomotives, partly by the greater use of American-built four-axle cars, which have a higher ratio of net to gross load, and partly, of course, by improved discipline and super-

vision. The use of the heavier locomotives, however, is bringing upon the railway the expensive necessity of changing out its old 72-lb. rail for heavier section.

The principal difficulty of the road, however, is its expensive fuel supply. This counsels early attention to the opening of coal mines of which there are not a few possibilities in its territory. The development of Harbin as a manufacturing center waits considerably upon this same factor, while the tonnage of the railway would be improved very decidedly by the addition of such traffic.

What Is Wrong With the Northwestern Roads?

Earning Less Than 2 Per Cent on Investment—Rates Only 37 Per Cent Above 1913

LAST MARCH, Great Northern preferred stock was selling on the stock exchange at slightly below 80, its highest price for the month and for the year 1923 to date being that figure exactly, reached on March 5. This price was high for a stock paying 5 per cent. It reflected the rather confident hope at the time that the company's directors at their pending meeting would find their way clear to restore the former established 7 per cent dividend rate. On Saturday last, Great Northern preferred reached a low of 51½, a low price for a 5 per cent stock even in the present depressed state of the stock market—the lowest price, in fact, which has been reached by the Great Northern stock since 1895. The price on Northern Pacific reached its highest thus far in 1923 on March 15, when it was 81½. On Saturday last it touched a low figure of 54½. Chicago, Milwaukee & St. Paul common—a non-dividend stock—has similarly had a wide range of like discouraging characteristics. Its high for the year was on March 5, 26⅜; on Saturday, August 4, it reached its low for the year to date of 15. Chicago & Northwestern common has had a range between 88 on March 5, and 61⅝ on August 4. These figures embody the concern with which the railway situation in the northwest has been regarded by those in financial circles. True it is that nearly all prices on the stock market have shown a sharp decline in recent months. There have been few shares, however, that have shown less resistance to decline in their quotations than have the shares of the roads here mentioned or their neighbors.

We have also had tangible evidence of the unsettled character of the railroad situation in the northwest in other ways than on the stock market. Such evidence is furnished, for example, in the establishment of a receivership for the Minneapolis & St. Louis, a property less fortunately situated than most of its neighbor roads and naturally one of the first, therefore, to suffer severely from the region's difficulties. The election of Magnus Johnson as U. S. Senator from Minnesota has, of course, served to attract attention to the northwest because the evidence seems to be that not the least factor in his victory was dollar wheat. Naturally it was promptly pointed out that the northwestern railroads would suffer if the buying power of their territory was limited by the disability of the farmer to secure more adequate return on his leading crop.

RATE OF RETURN—FIVE MONTHS ENDED MAY 31, 1923

Region and District	Net railway operating income	Rate of return (an. basis) on: Tentative valuation. Per cent	Rate of return (an. basis) on: Property investment (incl. material and supplies and cash)
New England Region	$2,625,382	*.....	0.88%
Great Lakes Region	73,308,928	*.....	6.46
Ohio-Indiana-Allegheny Region	93,570,297	*.....	6.66
Pocahontas Region	19,663,573	*.....	6.15
Total Eastern District (Incl. Pocahontas Region)	189,168,180	6.68	5.99
Southern District (Excl. Pocahontas Region)	61,052,524	6.79	5.75
Northwestern Region	19,918,101	*.....	1.96
Central Western Region	63,064,300	*.....	4.90
Southwestern Region	23,763,866	*.....	3.72
Total Western District	$106,746,267	4.20	3.62
United States	$356,966,971	5.69	4.98

*Not available.

Earnings Less Than 2 Per Cent

It is not the concern of the *Railway Age* to determine whether stock market price in the fifties represents a proper valuation of Great Northern preferred or Northern Pacific common stock. It may, however, be the concern of the *Railway Age* to point out that the stock market in quoting low prices on the shares of the northwestern roads has correctly drawn attention to the seriousness of the situation of these roads. Of course this seriousness has also been pointed out in other ways. In these very columns last week there were quoted, for example, certain figures which indicated that whereas the Class I railroads of the country in the first five months of 1923 earned on an annual basis 4.98 per cent on their property investment (5.69 on the tentative valuation established by the I. C. C. in Ex Parte 74 with subsequent additions), the roads in the northwestern region earned but 1.96 per cent. It was also shown that marked improvement over the May figures was not to be expected in June, or, in other words, in the six months' earnings.

NET OPERATING INCOME AND RATE OF RETURN, JUNE AND SIX MONTHS

	June, 1923		First six months, 1923	
	Net operating income	Per cent on tentative valuation (annual basis)	Net operating income	Per cent on tentative valuation (annual basis)
Eastern Dist. (Inc. Poca. Dist.)	$52,371,702	6.39	$240,731,330	6.59
Southern District	8,851,165	5.78	69,916,288	6.64
Western District	26,519,009	4.20	133,265,274	4.20
Total, United States	87,741,876	5.47	443,912,892	5.64

The difficulties of the northwestern roads may be classified as follows: (a) a rate level presumably inadequate and at any rate showing less increase over pre-war figures than that for any other region, (b) higher costs of wages, fuel and iron, steel, etc., as compared with pre-war figures, the increase being not only actual but it is believed possibly greater relatively as compared with that met by roads in other sections of the country, (c) taxes and (d) Panama Canal competition and a rate structure which prevents the transcontinental roads from competing for Pacific Coast business without undue sacrifice of net earnings on business to interior points. Another factor may be shortage of traffic due to the reduced buying power of the farmer in the wheat area. This factor, however, does not appear in the statistics to be as important as at first might be expected, true though

it is that the better part of the present heavy traffic on the country's roads is moving in the east rather than in the west.

Figures recently compiled by the Bureau of Railway Economics show some remarkably interesting details concerning the relative rate structures of the different districts into which the country's railroads are divided. The important point they bring out is the much smaller increase which the ton-mile earnings of the western roads show over their pre-war ton-mile receipts as compared with the increase shown in the similar figures for the roads in the South and East. Thus, the year 1913 is taken as a base. In that year, the roads of the country as a whole had receipts per ton-mile of 0.719 cents. The ton-mile rate in the Eastern district in that year was 0.628 cents; in the Southern district it was 0.674 cents, and in the Western district it was 0.884 cents. Figures were compiled also for a group of selected roads, namely the Milwaukee, the Great Northern, the Soo, the Minneapolis & St. Louis, the Northern Pacific and the Oregon-Washington, which group (constituting a portion of the present northwestern region) had ton-mile receipts of 0.796 cents or including also the Burlington of 0.779 cents. A comparison with 1922 gives results as follows: For all roads, an increase 1922 over 1913 of 63.6 per cent; eastern district, 86.5 per cent; southern district, 46.2 per cent, and for the list of selected roads, including the Burlington, an increase of but 42.7 per cent. The last named figure will be noted as being less than one-half the increase shown for the eastern district.

The Bureau also made a tabulation of the ton-mile receipts shown for the first three months of 1923 and from it,

AVERAGE RECEIPTS PER TON MILE

District	Year 1913 Rev. per ton mile, cents	Year 1913 Index	Year 1922 Rev. per ton mile, cents	Year 1922 Index	Year 1923 Rev. per ton mile, cents, 1st three months	Year 1923 "Indicated Index" for 1923
All roads (Class I)..	0.719	100	1.176	163.6	1.104	158.6
Eastern Group.....	0.628	100	1.171	186.5	1.096	182.2
Southern Group.....	0.674	100	0.987	146.4	0.964	142.6
Western Group.....	0.884	100	1.292	146.2	1.205	140.5
Selected West. Roads*	0.779	100	1.112	142.7	1.037	137.2

Figures prepared by Bureau of Railway Economics.

*Includes Milwaukee; Great Northern; Minneapolis & St. Louis; Minneapolis, St. Paul & Sault Ste. Marie, Northern Pacific; Oregon, Washington and Burlington.

there was further worked out what was termed an "indicated index" for the year 1923. The figures for the indicated index, based on the ton-mile receipts in 1913 as 100, were as follows: All roads, 158.6; eastern district, 182.2; southern district, 142.6; western district, 140.5, and for the list of selected roads, including the Burlington, 137.2, the lowest amount of increase shown in the entire list.

Discrepancy in the percentage increases in the several districts dates back first to the 15 Per Cent Case, giving the eastern lines a 15 per cent increase, effective August, 1917. During the period of federal control General Order No. 28, effective June 25, 1918, increased rates 25 per cent in all districts. Just prior to the end of the guaranty period in August, 1920, the decision in Ex Parte 74 allowed increases of 40 per cent in the eastern district, 25 in the southern, 35 in the western and 25 in the newly created, and it was thought especially favored, Mountain-Pacific group. Reductions in rates took place in 1922. They continued or emphasized the discrepancy existing in the western rate structure because the rates were greatest on the lower grade agricultural products. As concerns the 1922 averages they had a further adverse effect to the same end because the effective date was January 1 whereas the general rate reduction of 10 per cent which followed on other products did not go into effect until July 1. Whether improvement in the western rate situation may follow in the near future would be a question. Interstate Commerce Commission approval

NET TON MILES—FIRST FIVE MONTHS

	Eastern District	Western District	Southern District	Northwestern Region*	Total all Districts
1920.....	73,765,709	65,025,564	33,612,042	22,606,434	172,403,315
1921.....	60,288,985	48,099,361	27,052,258	15,085,321	135,440,604
1922.....	61,317,172	49,086,223	30,833,659	16,719,471	141,237,054
Total....	195,371,866	162,211,148	91,497,959	54,411,226	449,080,973
Average for 3 years....	65,123,955	54,070,382	30,493,320	18,137,075	149,693,657
1923.....	86,684,988	62,816,785	37,939,105	22,567,862	187,440,878
Per cent incr. 1923 over 1920 to 1922 aver....	33.11	16.18	24.42	24.43	25.42

*Included in Western District figures.

announced on Monday of increases in rates on grain from points on the Milwaukee and Chicago & Northwestern to Mississippi and Ohio river crossings is promising as far as it goes.

Traffic Comparisons

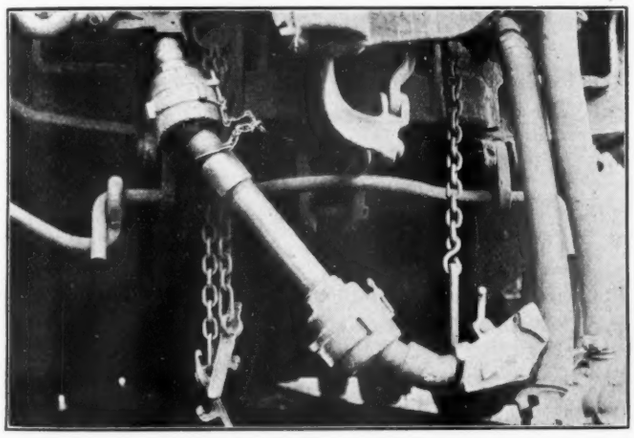
The question arises as to whether the western or northwestern roads are suffering from lack of traffic. The evidence is not to the effect that they are, although the facts do show that the western lines have not recently been favored with as marked expansion in their business as have the roads in the east. For the purposes of this article, a comparison has been made of the net ton miles (revenue and non-revenue) figures for the first five months of this year with averages for the corresponding five months' periods of 1920, 1921 and 1922. Traffic in all districts in the early months of this year was much ahead of normal; in the east and south it has been ahead of the heavy business of 1920 but this is not true in the west. The figures show that for all roads the net ton mile figures for the first five months of 1923 were 25.22 per cent in excess of the average for the corresponding periods of 1920, 1921 and 1922. The increase in the east has been 33.11 per cent. In the south, the increase has been 24.42 per cent over the three year average. The figure of increase for the west is shown to be 16.18 per cent, but in the northwestern region, it has been 24.43 per cent. This increase in traffic—as great as has been shown in the south—is sufficient to indicate no lack of business. That such an increase in traffic for the first five months of 1923 over the average for the corresponding periods of the three preceding years should permit the northwestern roads to show net operating income for the first five months of 1923 equivalent on an annual basis to only 1.96 per cent on their property investment is eloquent testimony that something must be wrong with the underlying conditions of the roads and particularly with their present rate structure.

There have been some observers who have contended that the heavier traffic in the northwest in the early months of 1923 was holdover business which did not move last fall because of the car shortage at that time. This may be true. It happens that May net ton miles in that region, although larger than April, were less than in January or March. It is also true that lumber business which was heavy in the first few months of the year has lately shown a slight falling off because of the retardation of building construction in the east. Nevertheless it is quite unlikely that the northwestern tonnage will fail to keep ahead of the average, for a period of months at least. The factor that is expected to keep it ahead of average is the heavy movement of ore. A record breaking ore movement is expected this year. The Great Northern has every expectation of moving no less than 17,000,000 tons of ore which of course would break all previous records. In July, for example, it loaded 52,999 cars of ore as compared with 34,837 in July a year ago. Indeed, no matter how one looks at it, everything seems to point to the fact that it is not lack of traffic but other conditions which are responsible for northwestern difficulties.

A Metal Steam Heat Connection for Passenger Cars

A METAL STEAM HOSE CONNECTION for steam heat train lines on passenger equipment has been developed by the Woodruff Ball Joint Company, Chicago, in which the gaskets are placed above the ball members, which are mechanically supported on metal bearing rings in the threaded sleeves below the joints.

While the joints are primarily designed for steam heat train line service they are also adapted for use on terminal steam heat connections in yards or at stations, for steam heat line connections between engine and tender, for blower lines in roundhouses or in any other service where a flexible steam line is required. For the latter purposes, where the line is not likely to be subjected to longitudinal pulling strains the body of the joint is provided with an integral nipple connection. This is shown in the sectional view of the joint. For use in train lines, however, the bodies are provided with internal threads for the insertion of pipe nipples, and the upper and lower joints in the hose connection are thus identical in detail. Each train line connection consists, first, of a lathe cut nipple, one end of which is inserted in the end valve and the other in the body of the upper joint; a pipe coupling, in the upper end of which is screwed the threaded end of the ball member and in the lower end an eight-inch or nine-inch piece of pipe, depending on the type of coupler head in use; the lower ball joint, which is screwed on the lower end of the pipe, and a special angle fitting to which the

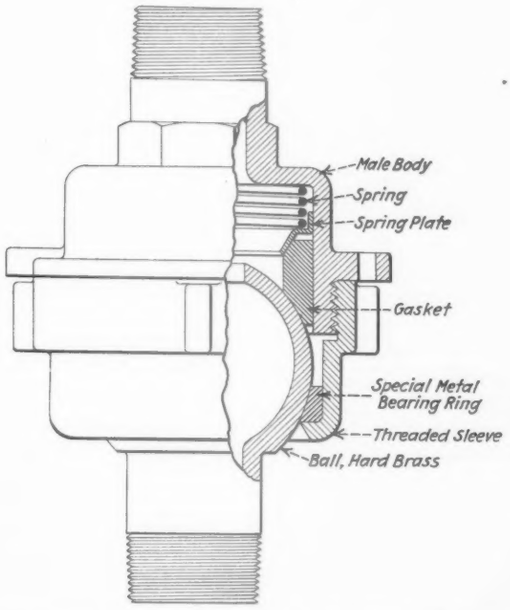


The Woodruff Flexible Metallic Steam Heat Connection Applied to a Passenger Car

coupler head is attached, which is screwed on the threaded end of the ball member of the lower joint. Two types of these angle fittings are provided, one for use with the Vapor link-lock and the Gold wedge-lock coupler heads and the other for the Chicago screw lock head. For the first two types named, the pipe between the joint is nine inches long and for the latter eight inches long.

Referring to the drawing, the construction of the joint itself will be readily understood. In the body of the joint is placed a composition gasket which is seated against the ball by a light spring and spring plate. The ball is supported mechanically on a ring of special bearing metal which rests on an inwardly projecting flange at the lower end of the sleeve. The sleeve is attached to the body of the joint by means of threads of coarse pitch while a cotter key inserted through a flange on the body of the joint and bearing against one of the spanner projections on the sleeves, locks the two parts together. The composition gasket is 1⅜ in. in length. Half of this length is serviceable material so that the gasket does not need renewal until it has been worn down to 11/16 in. The gasket contains graphite in its composition, softens and expands slightly when hot and retains a tight joint without attention through long periods of service. When cold it contracts and permits condensation to drain off so that the joint does not freeze. Ice formed on the outside of the joint and broken up forcibly through the movement of the joint in service is said to cause no damage, owing to the presence of the metal to metal joint at the bottom of the sleeve for mechanically supporting the ball member.

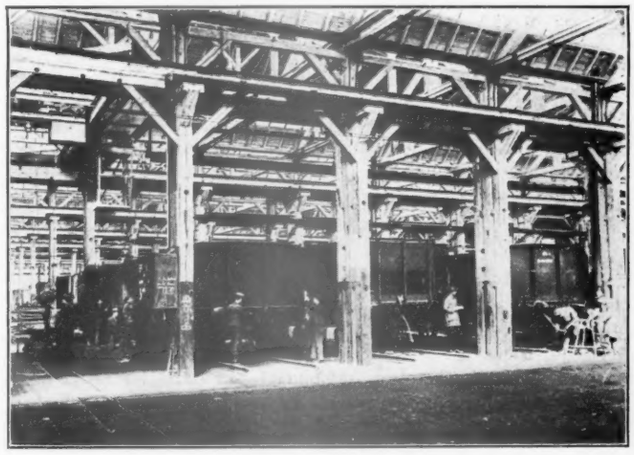
The use of the lathe cut nipple below the end valve is designed to prevent damage to the train line as well as to the ball joints themselves in case cars are uncoupled without first separating the steam line couplings. Should an ordinary



Details of the Woodruff Metal Bearing Ball Joint

stock nipple be used, however, it is said that the train line is still protected, the point of failure being transferred to the neck of the ball member of the top joint.

These joints have been in service on 10 cars for over a year and on 10 additional cars for more than six months. The type of gasket here described has been in service on the older installation since September, 1922, and no renewals have yet been required.



Building Gondola Cars at the Krupp Works, Essen, Germany

General News Department

The Brotherhood Investment Company, controlled by the Brotherhood of Locomotive Engineers, is said to be planning the opening of a bank in Baltimore, Md., to be capitalized at $1,000,000.

The Railway Treasury Officers' Association has changed the date of its annual meeting from October 18 and 19 to October 25 and 26. The meeting is to be held at the William Penn Hotel, Pittsburgh, Pa.

A crew of four men built a freight car in the shops of the Texas & Pacific at Marshall, Tex., on July 27 in 5 hr. and 55 min. The crew was one of eight engaged in a contest in building standard 36 ft. stock cars. The maximum time consumed in the contest by four men in building one of the cars was 6 hr. and 40 min.

The Missouri Pacific dedicated its new hospital at St. Louis, Mo., on July 29. The building is six stories high, of brick and stone construction and contains 300 beds and six operating rooms. It also has ample sun parlors, dressing rooms, serving rooms and dining rooms. The building cost $1,000,000, which was furnished by the Missouri Pacific Hospital Association.

The Colorado Midland has given to the State of Colorado three trestles which the state will use as highway crossings at Buena Vista and Granite in conjunction with the Busk-Ivanhoe tunnel, which was previously given to the state. It is expected that the former roadbed of the Midland from Divide to Glenwood Springs, a distance of about 260 miles, on which operation was suspended in 1919, will be used as a scenic highway.

The Kansas Public Utilities Commission has tentatively upheld the right of the Atchison, Topeka & Santa Fe to cross the right of way of the Kansas City Mexico & Orient at four places in Butler and Chase Counties, Kan. The Orient Line at these points was surveyed a number of years ago but it has not been graded. The Santa Fe has already crossed the Orient right-of-way in two places and will now cross it twice more in the construction of its new Eldorado line.

In observance of the funeral of President Harding the western railroads suspended all operations from 2:00 p. m., Central Standard time Friday, August 10, to 5:00 p. m. General offices in Chicago closed for the day at 1:00 p. m. and freight houses were closed all day, except for the delivery of perishable freight. Outside of Chicago offices and freight houses were closed wherever possible, business being carried on only in special cases.

Further Freight Rate Reductions

The British railways have voluntarily reduced freight rates from 60 per cent above pre-war to 50 per cent above, according to press dispatches from London. Rates have now been reduced three times since the peak and in every case the reductions have been voluntary. Wages, on the other hand, remain at 100 per cent and more above those which prevailed during the year 1913.

Freight Claim Meeting at Richmond

A joint meeting of the Committee on Freight Claim Prevention of the American Railway Association, representatives of carriers in the territory of the Virginian Claim Conference and members of the Richmond Chamber of Commerce was held at Richmond, Va., on July 24 to discuss freight claim prevention in general. It was decided to continue the policy of holding similar territorial meetings in other sections of the country and the next meeting will be held for the northwest Pacific Coast in September.

Program of Roadmasters' Convention

The Forty-first annual convention of the Roadmasters' and Maintenance of Way Association will be held at the Hotel Sherman, Chicago, on September 18-20, the program being as follows:

Convention called to order by president.
Address, "Selling the Railroads to the Public," by Hal S. Ray, director of personnel and public relations, Chicago, Rock Island & Pacific, Chicago.
President's address.
Report of committee on the maintenance of large yards.
Paper on Reducing Injuries Among Trackmen, by H. M. Mayo, superintendent of safety, Southern Pacific Lines, Houston, Tex.
Report of committee on laying rail and applying ballast on double track lines with single track operation.
Paper on Securing the Maximum Life from Ties, by S. D. Cooper, assistant manager treating plants, Atchison, Topeka & Santa Fe System, Topeka, Kan

WEDNESDAY

Report of committee on the training of section foremen.
Address on The Roadmaster's Part in the A. R. A. Program.
Address by Colonel F. G. Jonah, assistant to president and chief engineer, St. Louis-San Francisco, St. Louis, Mo.
Paper on the Maintenance of Joints, by R. S. Cochrane, chief engineer's office, A. T. & S. F.
Report of committee on standards of maintenance of light Traffic branch lines.
Address by W. G. Bierd, president, Chicago & Alton, Chicago.
Annual dinner of the Roadmasters' and Track Supply associations.

THURSDAY

Report of committee on labor saving devices.
Business session.

Thursday afternoon will be devoted to an inspection of the rail mill of the Inland Steel Company at Indiana Harbor, Ind. The Track Supply Association will present an exhibit of materials and devices used in the maintenance of tracks in rooms adjacent to the convention hall, 51 firms having already made reservation of space.

Pennsylvania Clerks Defend Company Association

Clerical employees on the Pennsylvania enrolled in the "company association" organized to replace the old Brotherhood of Railway and Steamship Clerks on the road have registered their disapproval of the continued efforts of the national brotherhood to again assume the right to represent them and have asked that they "be left free from interference from sources unable to be other than harmful" that they may "continue to improve their relationship with the carrier's management." The statement, which was signed by the Pennsylvania's Northwestern Region Clerical Employees Association, indicates the position of those most vitally concerned in the recent controversy before the Labor Board over the right of the Brotherhood of Railway Clerks to represent the clerical employees on the Pennsylvania. In their declaration, the clerks state that the employees representation plan of the Pennsylvania has been in effect over a period of two years, during which time a "spirit of sympathetic understanding, mutual co-operation and fair play has prevailed."

A Survey of the Railway Supply Business in Chicago

A survey of the railroad supply industry in Chicago, which was recently completed, has brought out the fact that there are between 400 and 450 concerns engaged in the railway supply business in that city. The total office space occupied by the trade aggregates 953,205 sq. ft., the annual rental for this space being $3,649,618. The survey was conducted by the Railroad Supply & Equipment Exchange, Inc., which has made plans for financing the construction of a building devoted exclusively to the railway supply trade. The building which is planned would contain a minimum of 1,000,000 sq. ft. of floor space for office purposes and five floors which can be devoted to the exhibition of railway equipment. A large convention hall and club accommodations, including sleeping rooms for out of town visitors, are also in-

cluded. It is planned that the rent for space in this building on long term leases shall not exceed $2 per sq. ft. for offices nor $1.50 per sq. ft. for display purposes. It is estimated that a reduction in rentals of nearly 50 per cent to the railway supply trade can be accomplished through location in such a building designed especially for the industry. It has been suggested that the proposed building house the indoor exhibits of the railroad Centennial celebration in 1928 and that the dedication of the building be held at that time.

Railway Earnings for June and Six Months

The net railway operating income of the Class I roads for June was $87,741,876 or on the basis of an annual return of 5.47 per cent on the tentative valuation making allowance for seasonal fluctuations, according to a preliminary compilation of the reports of the roads to the Interstate Commerce Commission, excluding the Louisiana Railway & Navigation Company of Texas which had not yet reported. The net for June was slightly over $2,000,000 less than that for May, which was on the basis of an annual return of 6.3 per cent, and was less than the 5¾ per cent standard fixed by the Interstate Commerce Commission. For the six months ended June 30 the net railway operating income was at the rate of 5.64 per cent for a year, as compared with 4.53 per cent for the corresponding period of last year. The Eastern roads for June earned at the rate of 6.39 per cent and the Southern roads at the rate of 5.78 per cent, but the Western roads had a return of only 4.2 per cent. For the six months' period the Eastern and Southern roads were above the 5¾ per cent standard, with 6.59 per cent and 6.64 per cent respectively, as compared with 5.26 and 5.31 for the first six months of last year, but the Western roads fell below, with only 4.2 per cent, as compared with 3.43 per cent for last year.

Total operating revenues for June showed an increase of 14.6 per cent as compared with June of last year. Operating expenses increased only 11.7 per cent but maintenance expenses were 16.9 per cent greater than last year. The net shows an increase of 15 per cent. For the six months the increase in operating revenues was 18.5 per cent and the increase in maintenance expenses was 18 per cent, but the increase in total operating expenses was only 17.5 per cent and the increase in net was 27.2 per cent. The preliminary compilation is as follows:

PRELIMINARY REPORT OF REVENUES AND EXPENSES
CLASS I ROADS AND LARGE SWITCHING AND TERMINAL COMPANIES

Item and District	Month of June 1923	Month of June 1922	Per cent of increase	6 months' period ended June 30 1923	6 months' period ended June 30 1922	Per cent of increase
Total Operating Revenues:						
Eastern District (incl. Poca. Reg.)	$284,447,945	$225,817,128	26.0	$1,598,812,614	$1,298,560,010	23.1
Southern District (excl. Poca. Reg.)	65,563,345	61,004,672	7.5	409,102,299	347,720,103	17.8
Western District	191,151,688	185,212,293	3.2	1,088,741,743	967,796,862	12.5
Total, United States	541,162,978	472,034,093	14.6	3,096,656,656	2,613,676,975	18.5
Total Maintenance Expenses:						
Eastern District (incl. Poca. Reg.)	102,210,794	84,637,775	20.8	563,729,750	464,438,985	21.4
Southern District (excl. Poca. Reg.)	25,022,630	20,864,474	19.9	140,171,425	118,081,882	18.7
Western District	74,791,862	67,390,251	11.0	402,933,007	355,161,154	13.5
Total, United States	202,025,286	172,892,500	16.9	1,106,834,182	937,682,021	18.0
Total Operating Expenses:						
Eastern District (incl. Poca. Reg.)	213,010,980	178,547,492	19.3	1,254,080,126	1,027,630,138	22.0
Southern District (excl. Poca. Reg.)	52,432,297	54,996,290	d4.7	313,121,560	269,132,506	16.3
Western District	151,464,508	139,734,736	8.4	877,616,570	783,279,352	12.0
Total, United States	416,907,785	373,278,518	11.7	2,444,818,256	2,080,041,996	17.5
Net Railway Operating Income:						
Eastern District (incl. Poca. Reg.)	52,371,702	33,236,220	57.6	240,731,330	187,647,101	28.3
Southern District (excl. Poca. Reg.)	8,851,165	10,724,050	d17.5	69,916,288	54,723,612	27.8
Western District	26,519,009	32,310,393	d17.9	133,265,274	106,698,257	24.9
Total, United States	87,741,876	76,270,663	15.0	443,912,892	349,068,970	27.2
Rate Earned, Annual Basis:						
Eastern District (incl. Poca. Reg.)	6.39	4.15	....	6.59	5.26	....
Southern District (excl. Poca. Reg.)	5.78	7.15	....	6.64	5.31	....
Western District	4.20	5.23	....	4.20	3.43	....
Total, United States	5.47	4.86	....	5.64	4.53	....

Note—"Rate earned, annual basis" is based on the tentative valuation as fixed by the Interstate Commerce Commission, plus additions and betterments to date. The rate is computed after taking into account seasonal fluctuations in traffic and earnings.
Foregoing excludes Louisiana Ry. & Nav. Co. of Texas, not yet reporting.
d Denotes decrease.

Soo Line and C. & E. I. Insure Passengers

The Minneapolis, St. Paul & Sault Ste. Marie and the Chicago & Eastern Illinois have inaugurated the sale of travel accident insurance to passengers purchasing tickets over these lines. This will be designated as passenger coupon accident insurance which is available for both men and women and which is sold to cover short or long trips with a premium fixed at an amount equal to one per cent of the cost of the railroad ticket.

C. & N. W. Engineman Ends 55 Years' Service

When John Reihansperger, engineer on the Chicago & North Western, completed his run from Rockford, Ill., to Chicago on July 31, he concluded 55 years and two months of service with the company, and, having reached the age of 70 years, retired

North Western Engineman Completes 55 Years' Service

on a pension. Mr. Reihansperger was the oldest engineer on the Galena division of the North Western. He was born at St. Charles, Ill., on July 28, 1853, and when one year old moved to Turner Junction, Ill., now West Chicago, with his parents. At the age of 14 years, he entered the employ of the North Western in the machine shop, where he ran a drill machine. In April, 1869, he began firing on a road engine, his first regular assignment being on the old Pioneer. He was promoted to engineer on July 21, 1877, and has held this position on various runs continuously since that time. The accompanying photograph shows a group of North Western officers congratulating Mr. Reihansperger on the completion of his last run.

Labor Board Again Rebukes Erie

The Railroad Labor Board on August 8 published another series of rebukes of the Erie for its treatment of its employees represented by the American Federation of Railroad Workers, the Brotherhood of Dining Car Conductors and the American Train Dispatchers' Association. With regard to the American Federation of Railroad Workers the Erie was reprimanded for its failure to apply a two-cent an hour wage increase to the employees of the Lincoln Engineering Corporation and the Charles Wagner Construction Company, contractors for certain of the road's maintenance work. In the case of the American Train Dispatchers' Association the road was censured for its failure to observe a decision of the Board which ordered that the train dispatchers be reimbursed for amounts arbitrarily deducted from their earnings and for rest days which they were required to work during the months of January, February and Mach, 1921. The rebuke in the instance of the brotherhood of dining car conductors was administered for the Erie's refusal to obey the decision of the Labor Board ordering that the rules governing working conditions for employees in this service in effect December 31, 1920, be restored and continued in effect until changed by mutual agreement between the employees and the carrier, according to the Transportation Act of 1920.

Commercial Stocks of Coal

On July 1, 1923, commercial consumers had in storage approximately 45,000,000 net tons of soft coal, according to a survey undertaken by the Bureau of the Census, Department of Commerce, and the Geological Survey, Department of the Interior, under authority of the federal fuel distributor. This was an increase over the revised figures of stocks on June 1, 1923, of 3,000,000 tons. Except in the month of February stocks have steadily risen since September 1, 1922, and there is now in storage twice the quantity that was on hand on that date. There are no records for the corresponding date of preceding years, but the supply on July 1, 1923, was larger than on any date since the spring of 1922, when exceptionally heavy supplies had been accumulated in anticipation of the general strike of miners that was called on April 1, 1922. Stocks on July 1 exceeded those on August 1, 1921, by 4,000,000 tons, and were nearly 5,000,000 tons larger than on April 1, 1919.

Measured in terms of tons, stocks increased 7.1 per cent during June. Measured in terms of days' supply, the increase was 23.3 per cent. The larger increase in days' supply was due to the fact that the rate of consumption decreased perceptibly in June, thereby increasing the length of time the tonnage on hand would last. At the rate of consumption in June the stocks on July 1 were sufficient to last 37 days on the average. Stocks on the Lake docks at Duluth-Superior and Ashland-Washburn on July 1, 1923, were about 2,850,000 net tons. Records for the Lake Michigan docks are not available. A group of producers who store coal at the mines or at some intermediate point had 688,000 tons in storage on July 1.

Estimates of railroad-fuel stocks, based on reports submitted by the American Railway Association, place the total quantity held by the railroads in stock-piles, cars, and chutes, on July 1, at 10,550,000 tons. a supply sufficient for 28 days. In comparison with June 1 this was an increase in days' supply of 33 per cent.

Additional Prizes for Fuel Economy Paper

Additional prizes for the best paper on fuel economy submitted in the International Railway Fuel Association's prize contest, described on page 1710 of the June 30, 1923, *Railway Age*, are offered by the technical press and the railroads as follows:

Railway Age:
$50 additional to prize offered for the best paper.

Railway Review:
$10 additional to prize offered by each railroad.

New York Central:
$100 additional to any local winner.

Illinois Central:
$100 additional to any local winner.

Missouri, Kansas & Texas:
$100 additional to any local winner. $150 additional will be divided equally among writers of the next three best local papers.

Nashville, Chattanooga & St. Louis:
$100 additional to any local winner. $25 for the best local paper.

Southern Pacific:
Free trip to the 1924 convention of the I. R. F. A.

Long Island:
Free trip to the 1924 convention of the I. R. F. A.

Central of Georgia:
$25 additional to any local winner.
$10 for the best paper submitted by C. of G. employee.

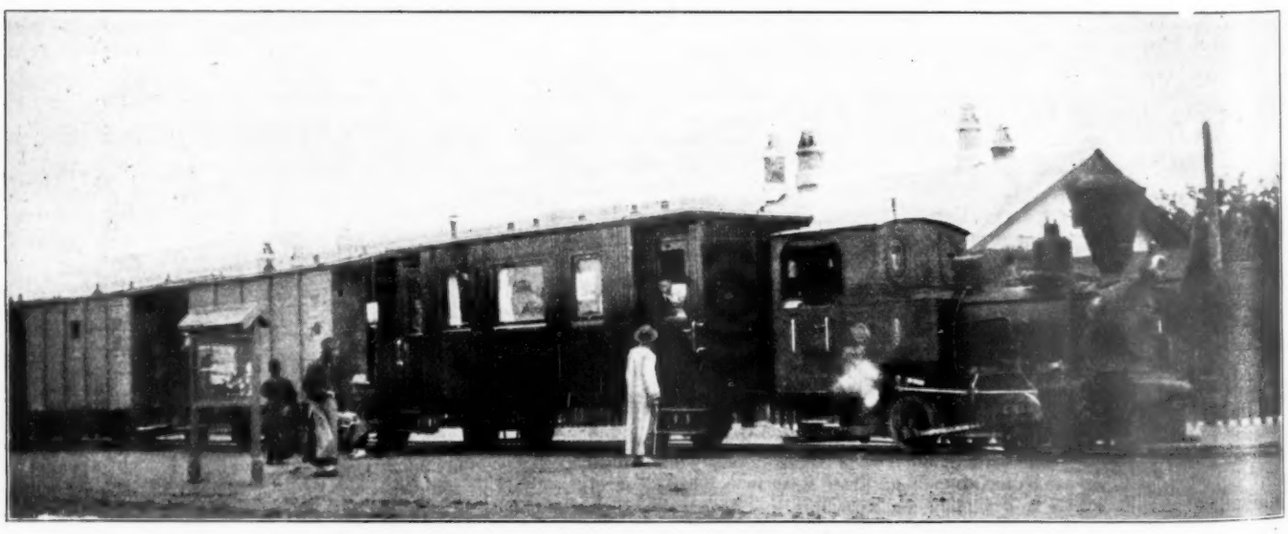
Philadelphia & Reading:
$25 for the best local paper.

Missouri Pacific:
$100 to writer of best paper offered by Missouri Pacific employees.

Wabash:
An additional prize.

Northern Pacific:
$50 additional prize to the winner if a N. P. employee.

New York, New Haven & Hartford:
Offering special prizes.



Train on Narrow Gage Line Connecting with Chinese Eastern at Tsitsi Kai, Manchuria

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1923

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Akron, Canton & Youngstown	June	170	$242,428	$755	$250,005	$37,196	$21,386	$8,432	$76,938	$9,314	$153,266	61.30	$96,739	$82,424	$44,839	$41,292
	6 mos.	170	1,276,074	5,242	1,337,586	194,110	117,823	48,722	394,871	53,967	809,493	60.50	528,093	443,657	289,935	270,567
Alabama & Vicksburg	June	141	184,627	64,506	269,935	42,548	39,814	8,444	88,772	11,576	193,334	71.60	76,601	39,199	47,087	38,142
	6 mos.	141	1,203,724	345,497	1,671,790	254,401	301,916	54,954	587,279	72,380	1,282,481	76.70	389,309	209,909	261,745	186,071
Vicksburg, Shreveport & Pacific	June	188	208,244	98,570	331,673	47,778	61,829	10,845	111,895	13,381	248,377	74.80	83,296	49,261	41,828	55,475
	6 mos	179	1,370,184	561,868	2,100,366	282,237	369,462	66,256	697,579	82,041	1,512,649	72.00	587,717	403,149	343,052	197,014
Ann Arbor	June	293	405.669	40,717	470,545	61,888	103,368	8,610	175,413	12,467	361,757	76.90	108,788	86,354	65,699	51,201
	6 mos.	293	2,160,634	229,319	2,503,920	296,676	645,741	53,056	1,151,202	78,404	2,225,052	88.90	278,868	144,135	—66,562	256,793
Atchison, Topeka & Santa Fe	June	8,947	10,653,411	4,311,312	16,260,907	2,904,799	4,205,919	293,610	5,187,931	390,994	12,902,519	79.30	3,358,388	2,263,145	2,430,989	2,725,943
	6 mos.	8,946	66,136,856	22,285,375	96,550,970	12,569,243	23,378,227	1,739,780	31,133,442	2,076,673	70,560,767	73.10	25,990,263	18,720,533	20,022,243	11,522,790
Gulf, Colorado & Santa Fe	June	1,908	1,307,721	363,139	1,783,129	538,336	537,470	43,634	644,909	59,075	1,822,453	162.20	—39,324	—120,810	—179,084	275,954
	6 mos.	1,908	8,222,595	1,933,702	10,890,455	2,454,323	2,941,408	269,197	3,873,820	374,704	9,904,424	90.90	986,031	498,527	180,426	—26,132
Panhandle & Santa Fe	June	858	387,551	116,734	548,180	134,085	225,664	7,365	191,708	17,308	575,822	105.00	—27,642	—50,754	—81,435	—26,605
	6 mos.	858	2,747,483	653,778	3,630,622	594,925	1,254,331	46,847	1,220,781	107,331	3,220,951	88.70	409,671	254,082	84,847	—266,165
Atlanta & West Point	June	93	135,530	80,931	244,505	34,257	40,247	9,270	83,294	12,428	184,024	75.20	60,481	49,757	41,056	23,334
	6 mos.	93	841,630	449,723	1,451,151	218,669	229,358	55,592	504,540	70,407	1,100,938	75.90	350,213	266,254	213,255	68,529
Western of Alabama	June	133	140,668	72,653	236,993	33,907	45,548	10,876	69,288	11,291	175,120	73.90	61,875	54,655	54,396	46,706
	6 mos.	133	896,689	414,850	1,441,442	188,722	264,377	62,658	454,422	68,579	1,057,905	73.40	383,537	305,618	298,746	180,334
Atlanta, Birmingham & Atlantic	June	639	259,057	48,683	334,280	65,624	91,002	22,431	175,293	15,136	369,551	110.50	—35,271	—47,738	—44,025	—67,687
	6 mos.	639	1,871,105	264,999	2,286,876	403,748	536,611	131,434	1,182,945	90,227	2,345,543	102.50	—58,667	—137,822	—176,394	—374,820
Atlantic Coast Line	June	4,860	4,622,917	1,238,864	6,369,570	924,481	1,658,933	96,155	2,251,015	144,745	5,095,636	80.00	1,273,934	897,925	807,519	956,249
	6 mos.	4,860	30,577,034	9,769,096	43,525,787	4,890,773	8,653,936	662,334	15,041,805	878,949	30,359,919	69.80	13,165,868	10,960,399	10,193,394	8,845,354
Charleston & Western Carolina	June	342	271,543	35,942	322,792	61,572	43,536	7,172	129,719	6,122	248,067	76.90	74,725	58,539	37,848	54,198
	6 mos.	342	1,732,771	209,337	2,020,804	299,088	268,743	41,993	821,003	40,000	1,470,517	72.40	560,287	483,923	370,440	335,250
Baltimore & Ohio	June	5,212	18,114,182	2,910,840	22,515,545	2,190,059	6,169,426	349,840	7,916,786	496,539	17,278,011	76.70	5,237,534	4,419,399	4,004,590	2,666,332
	6 mos.	5,212	107,609,618	14,196,351	129,797,389	12,862,488	33,002,081	1,930,186	48,047,774	2,892,718	99,513,427	76.70	30,283,962	25,310,695	22,825,908	14,580,295
Baltimore & Ohio Chic. Terminal	June	83	.....	.....	325,753	37,007	44,835	1,738	167,436	10,135	266,021	81.70	59,732	19,255	42,637	98,120
	6 mos.	83	.....	.....	1,869,306	172,928	248,175	11,541	1,073,829	59,324	1,590,827	85.10	278,479	28,002	259,607	567,531
Staten Island Rapid Transit	June	23	82,859	122,990	238,187	37,436	34,550	1,933	123,828	14,800	212,547	89.20	25,640	13,140	—291	—59,114
	6 mos.	23	498,024	562,296	1,196,099	167,161	211,033	11,480	695,932	82,238	1,167,844	97.60	28,255	—62,208	—158,973	—294,225
Bangor & Aroostook	June	616	384,998	66,832	475,669	132,328	119,630	4,099	151,364	18,032	427,671	89.90	47,998	14,440	47,262	56,685
	6 mos.	616	2,891,493	456,428	3,400,433	727,451	716,318	27,062	1,120,766	108,821	2,709,967	77.60	780,466	517,920	781,867	1,353,125
Belt Ry. Co. of Chicago	June	32	.....	.....	580,823	50,565	54,498	2,642	238,933	9,727	356,365	61.30	224,458	184,553	150,677	131,957
	6 mos.	32	.....	.....	3,599,811	301,866	357,337	14,203	1,617,559	59,972	2,350,937	65.30	1,248,874	1,009,343	893,291	828,984
Bessemer & Lake Erie	June	228	2,256,820	24,253	2,330,188	135,376	464,028	13,196	489,773	32,660	1,125,282	48.30	1,204,906	1,093,184	1,142,685	461,268
	6 mos.	228	8,535,864	170,854	8,910,170	628,896	2,576,708	92,338	2,445,111	168,730	5,899,230	66.20	3,010,940	2,610,628	3,631,127	364,430
Bingham & Garfield	June	34	38,132	.....	39,520	6,886	5,079	1,204	10,251	3,497	27,035	68.40	12,485	4,874	17,030	2,911
	6 mos.	34	212,643	15	221,551	37,758	28,053	8,092	54,993	22,334	152,209	68.70	69,342	24,751	96,614	—77,086
Boston & Maine	June	2,286	4,976,584	1,815,366	7,703,567	957,991	1,564,584	53,870	3,361,166	204,959	6,163,821	80.00	1,539,746	1,298,948	885,308	769,878
	6 mos.	2,286	27,067,655	10,866,095	42,885,730	6,027,620	9,681,065	320,578	21,617,516	1,268,118	39,049,520	91.10	3,836,210	2,406,019	—837,002	2,945,100
Brooklyn Eastern District Terminal	June	9	104,872	.....	111,213	6,564	11,065	549	45,804	4,792	68,774	61.80	42,439	36,084	36,084	45,531
	6 mos.	9	784,258	.....	839,057	32,636	81,541	2,507	299,031	31,511	447,226	53.30	391,831	335,856	337,896	283,732
Buffalo & Susquehanna R. R. Corp.	June	253	219,412	4,622	228,111	46,472	90,096	2,005	66,181	10,019	214,773	94.20	13,338	3,688	49,766	—32,983
	6 mos.	253	1,363,562	33,353	1,419,634	228,753	474,917	12,351	446,948	53,249	1,215,891	85.60	203.743	126,942	434,517	58,639
Buffalo, Rochester & Pittsburgh	June	589	1,646,654	140,494	1,887,850	434,093	562,724	26,440	688,557	43,080	1,732,948	91.80	154.902	119,800	251,751	—186,917
	6 mos.	589	10,503,422	859,932	11,803,633	1,767,606	3,976,638	153,435	4,503,555	258,954	10,645,859	90.20	1,157,774	947,374	1,693,849	406,499
Canadian Pacific Lines in Maine	June	233	104,810	37,515	156,811	65,207	45,572	4,574	81,101	3,518	198,972	126.90	—42,161	—57,161	—74,876	12,591
	6 mos.	233	1,271,838	224,658	1,591,271	247,568	310,342	27,338	748,094	22,734	1,356,076	85.20	235,195	145,195	72,852	83,381
Carolina, Clinchfield & Ohio	June	309	751,942	47,285	813,156	91,189	238,762	24,938	205,908	20,550	581,002	71.50	232,154	182,006	229,850	321,916
	6 mos.	309	4,378,495	257,818	4,720,435	436,366	1,320,368	150,490	1,338,164	115,851	3,359,260	71.20	1,361,175	1,060,329	1,378,942	1,506,416
Central of Georgia	June	1,920	1,383,469	477,851	2,082,494	280,364	457,378	68,515	845,958	93,612	1,750,836	84.10	331,658	245,403	240,235	403,140
	6 mos.	1,920	9,172,543	2,753,380	13,187,511	1,639,102	2,655,100	420,688	5,183,476	488,292	10,438,820	79.20	2,748,691	2,132,424	2,101,926	1,747,837
Central of New Jersey	June	694	3,928,547	849,395	5,100,892	438,992	1,602,827	38,075	1,986,860	102,423	4,188,456	82.10	912,436	638,665	587,970	—112,518
	6 mos.	694	22,522,103	4,275,742	28,539,556	2,564,521	7,811,263	233,162	12,482,339	625,185	23,831,990	83.50	4,767,566	2,927,613	2,516,568	1,681,722
Central Vermont	June	533	551,000	99,030	741,350	167,113	126,674	13,633	354,192	21,559	684,376	92.30	56,974	35,860	—5,316	2,186
	6 mos.	533	3,291,250	625,841	4,355,650	575,215	766,725	78,504	2,441,862	122,150	3,994,050	91.70	361.600	237,315	—137,671	21,010
Chesapeake & Ohio	June	2,552	7,088,388	1,087,103	8,650,025	1,088,468	2,402,569	92,532	2,687,811	189,366	6,497,553	75.10	2,152,472	1,846,577	1,803,793	2,452,539
	6 mos.	2,552	40,318,488	5,432,328	48,264,859	5,634,855	13,405,104	511,485	16,389,555	1,096,839	37,219,351	77.10	11,045,508	9,204,692	9,428,045	9,644,657
Chicago & Alton	June	1,050	1,838,003	662,781	2,725,222	368,789	676,494	63,067	396,485	33,539	1,992,564	73.10	732,658	648,702	525.427	88,339
	6 mos.	1,050	11,755,336	3,286,315	16,367,514	1,861,484	4,491,872	354,678	5,770,598	316,192	12.792.081	78.20	3,575,433	3,065,935	2,389,524	1,154,084
Chicago & Eastern Illinois	June	945	1,559,951	449,944	2,226,104	299,051	766,523	44,044	847,977	70,725	2,040,687	91.70	185,417	74,620	142,436	60.797
	6 mos.	945	10,811,507	2,372,020	14,245,495	1,542,642	4,449,876	268,932	5,604,050	418,950	12.357.134	86.70	1,888,361	1,213,080	1,717,299	1,119,477
Chicago & Northwestern	June	8,462	9,749,598	2,782,916	14,099,061	2,551,505	3,317,522	152,434	5,478,113	351,025	11,908,018	84.50	2,191,043	1,435,205	1,242,575	2,389,331
	6 mos.	8,462	55,579,721	14,340,548	77,940,643	10,129,903	19,460,626	975,049	34,079,910	2,021,543	66,999,745	86.00	10.940,898	6,419,199	4,980,937	6,331,403
Chicago, Burlington & Quincy	June	9,405	9,370,233	2,684,829	13,554,376	2,678,803	3,758,371	289,550	4,718,259	343,977	11,897,474	87.80	1,656,902	861,936	709,656	1,776,039
	6 mos.	9,397	63,310,874	13,224,390	84,779,771	10,625,483	20,330,269	1,380,320	32,343,866	2,146,496	67.409,445	79.50	17,370,326	11,931,347	11,031,844	11,659,072
Chicago Great Western	June	1,496	1,669,168	381,834	2,233,782	474,046	491,047	62,812	846,071	55,488	1,942,567	87.00	291,215	212.889	132,837	—13,927
	6 mos.	1,496	9,666,647	2,074,787	12,787,866	1,761,687	2,861,350	387,067	5,455,830	329,632	10,870,326	85.00	1,917,540	1,440,637	865,804	—148,449

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Chicago, Indianapolis & Louisville	June	657	$1,004,583	$263,756	$1,423,095	$182,507	$319,739	$28,745	$493,249	$33,048	$1,072,483	75.40	$350,612	$270,677	$127,901	$142,220
	6 mos.	657	6,557,475	1,572,891	8,993,224	886,342	1,986,696	194,528	3,297,196	205,766	6,660,853	74.10	2,332,371	1,867,381	1,023,605	868,136
Chicago, Milwaukee & St. Paul	June	11,010	10,127,359	2,304,085	14,089,084	2,697,296	3,077,951	191,902	5,184,240	318,512	11,524,708	81.80	2,564,376	1,770,838	1,311,982	1,215,105
	6 mos.	11,017	63,369,652	11,694,284	83,677,152	11,231,942	20,603,576	1,120,538	34,234,798	1,878,959	69,397,910	82.90	14,279,242	9,529,322	6,669,015	1,617,155
Chicago, Peoria & St. Louis	June	247	76,608	11,680	98,442	15,065	19,745	1,159	54,609	8,960	99,538	101.10	1,096	—10,596	—21,855	—66,492
	6 mos.	247	539,437	79,488	676,688	111,996	137,542	13,607	395,532	54,320	712,997	105.40	—36,309	—93,393	—165,428	—248,100
Chicago River & Indiana	June	19	.....	.....	598,874	59,890	56,225	847	224,890	17,392	358,844	59.90	240,030	204,782	278,619	267,017
	6 mos.	19	.....	.....	3,727,940	331,764	411,039	6,110	1,477,892	71,558	2,298,383	61.70	1,429,551	1,204,774	1,689,403	.....
Chicago, Rock Island & Pacific	June	7,635	6,937,283	2,424,396	10,202,006	1,342,365	2,538,076	195,182	4,219,652	263,759	8,622,611	84.50	1,579,395	1,131,948	798,673	1,783,169
	6 mos.	7,635	42,423,920	12,645,045	59,599,477	7,663,675	14,405,343	1,139,492	25,957,293	1,521,280	54,001,126	85.60	8,598,351	5,662,127	3,705,972	4,971,126
Chicago, Rock Island & Gulf	June	461	363,018	81,424	486,370	69,250	67,469	13,875	231,696	14,603	397,864	81.80	88,506	76,229	54,140	99,024
	6 mos.	461	1,907,960	435,343	2,577,376	475,435	444,141	78,289	1,332,398	90,305	2,428,378	94.20	148,998	74,921	—8,093	240,305
Chic., St. Paul, Minn. & Omaha	June	1,749	1,514,511	556,475	2,273,195	392,486	488,837	34,814	1,001,547	71,595	1,997,611	87.90	275,584	144,759	130,053	400,904
	6 mos.	1,749	9,734,168	3,026,692	13,781,030	1,619,895	2,926,320	208,486	6,636,221	422,590	11,861,309	86.10	1,919,721	1,114,200	1,166,804	1,030,376
Cincinnati, Indianapolis & Western	June	347	286,481	40,394	354,950	52,014	76,659	13,612	139,644	19,277	302,444	85.20	52,506	31,988	24,628	19,437
	6 mos.	347	1,903,141	226,350	2,312,794	263,686	496,480	69,530	992,577	113,651	1,944,317	84.10	368,477	250,298	115,727	—8,231
Colorado & Southern	June	1,099	771,340	184,192	1,030,044	188,468	271,620	12,285	401,223	43,720	926,523	89.90	103,521	35,283	32,838	116,824
	6 mos.	1,099	4,739,705	928,393	6,132,392	810,412	1,841,889	82,093	2,527,997	256,565	5,564,733	90.70	567,659	178,599	211,916	681,332
Fort Worth & Denver City	June	456	472,354	199,910	719,522	78,932	154,200	15,981	247,262	34,530	534,391	74.30	185,141	147,613	202,158	273,372
	6 mos.	456	3,073,265	908,409	4,265,246	451,794	1,120,144	73,097	1,413,862	208,576	3,281,206	76.90	984,040	738,705	995,580	1,189,590
Wichita Valley	June	271	75,266	24,867	106,686	15,724	8,118	21	39,642	1,783	64,079	60.10	42,607	36,968	24,924	6,809
	6 mos.	266	469,776	117,292	627,698	111,754	67,589	234	243,016	9,936	430,097	68.50	197,601	162,093	98,845	48,615
Columbus & Greenville	June	167	88,965	26,092	121,971	36,182	15,944	3,243	45,560	8,130	108,940	89.30	13,031	11,091	—1,200	7,432
	6 mos.	167	528,030	168,097	739,030	209,824	94,160	20,234	270,895	61,559	656,055	88.80	82,975	86,509	10,256	17,057
Delaware & Hudson	June	886	3,897,131	292,919	4,454,137	324,670	1,037,997	38,581	1,601,332	140,986	3,171,909	71.20	1,282,228	1,197,051	1,155,890	—292,905
	6 mos.	886	19,833,495	1,740,411	22,961,570	2,076,639	6,356,072	224,996	9,983,288	847,735	19,660,410	85.60	3,301,160	2,789,696	2,510,575	1,494,268
Delaware, Lackawanna & Western	June	993	5,907,002	1,196,220	8,005,941	677,443	1,681,716	113,868	2,972,023	156,639	5,662,234	70.70	2,343,707	1,880,131	1,929,721	411,745
	6 mos.	993	31,590,342	6,552,619	43,200,096	3,708,018	11,187,861	626,116	19,026,123	927,867	35,801,615	82.90	7,398,481	4,869,845	5,373,650	4,726,070
Denver & Rio Grande Western	June	2,593	1,934,382	538,354	2,725,111	464,518	802,795	57,622	959,904	88,371	2,430,176	89.20	284,935	127,111	322,840	482,302
	6 mos.	2,593	11,505,390	2,452,226	15,299,225	2,005,438	4,773,693	298,138	5,947,938	494,801	13,774,301	90.00	1,524,924	514,624	997,285	2,653,151
Denver & Salt Lake	June	255	257,096	31,751	311,397	42,259	72,765	1,135	107,538	5,594	229,291	73.60	82,106	73,070	68,533	—52,824
	6 mos.	255	859,120	105,480	1,086,899	230,559	443,065	6,325	437,342	34,994	1,152,285	106.00	—65,386	—119,523	—103,289	—98,220
Detroit & Mackinac	June	380	127,196	27,825	172,558	49,573	46,933	2,091	58,710	6,520	163,597	94.80	8,961	—558	3,881	22,243
	6 mos.	384	653,948	171,139	898,217	184,856	281,017	12,244	370,748	35,131	883,524	98.30	14,693	—29,274	27,365	—109,340
Detroit & Toledo Shore Line	June	61	344,450	.....	349,808	32,888	28,615	2,434	107,920	7,120	178,977	51.20	170,831	152,531	65,141	112,092
	6 mos.	61	2,157,620	.....	2,187,371	170,678	177,738	14,313	649,077	43,332	1,056,138	48.30	1,131,233	1,021,433	483,136	500,271
Detroit, Toledo & Ironton	June	454	844,364	8,883	874,559	115,940	89,126	5,046	273,255	23,848	497,709	56.90	376,850	363,276	216,188	123,409
	6 mos.	454	4,873,370	56,288	5,031,436	627,824	804,258	39,178	1,780,393	140,025	3,320,599	66.00	1,710,837	1,634,317	859,867	705,518
Duluth & Iron Range	June	279	1,066,147	15,845	1,177,105	153,652	132,525	1,409	273,898	19,993	581,479	49.40	595,626	508,859	517,350	712,391
	6 mos.	279	2,608,145	114,696	2,993,380	550,175	773,821	7,154	1,154,585	109,582	2,597,586	86.80	395,794	181,439	189,223	103,988
Duluth & Missabe & Northern	June	305	2,880,224	16,667	3,188,263	244,794	164,430	2,691	508,978	21,361	943,243	29.60	2,245,020	1,988,399	1,982,327	1,644,808
	6 mos.	305	5,591,455	129,270	6,375,246	911,407	1,167,387	17,127	1,701,527	122,844	3,929,130	61.60	2,446,116	1,445,158	1,425,892	185,778
Duluth, South Shore & Atlantic	June	591	377,305	94,842	524,442	95,765	89,551	6,785	219,700	12,465	429,306	81.90	95,136	67,093	46,454	41,224
	6 mos.	591	2,046,863	550,322	2,810,687	358,572	455,770	37,814	1,431,457	71,378	2,387,642	84.90	423,045	248,979	136,655	—258,772
Duluth, Winnipeg & Pacific	June	178	150,546	18,203	176,674	49,511	45,909	3,896	65,941	8,239	173,566	98.20	3,108	—5,761	—14,665	35,077
	6 mos.	178	1,133,535	135,784	1,311,286	202,214	265,270	21,845	555,450	36,761	1,080,922	82.40	230,364	120,010	115,400	13,327
Elgin, Joliet & Eastern	June	459	2,193,726	1	2,843,235	215,495	522,864	10,971	711,435	39,433	1,499,296	60.40	983,939	870,741	666,954	339,745
	6 mos.	459	12,877,113	56	14,377,518	1,001,374	3,563,530	72,753	4,442,212	217,959	9,296,394	64.70	5,081,124	4,548,594	3,417,407	2,877,166
El Paso & Southwestern	June	1,139	933,278	183,002	1,174,912	183,257	226,405	60,705	342,723	41,820	863,735	73.50	311,177	205,318	139,489	178,582
	6 mos.	1,139	5,036,989	1,067,103	6,442,382	1,136,051	1,299,396	217,002	1,784,895	245,597	4,738,646	73.60	1,703,736	1,125,474	1,008,227	756,598
Erie R. R.	June	2,039	7,947,102	1,155,456	9,854,901	1,301,159	2,616,385	141,860	3,641,963	282,064	8,039,447	81.60	1,815,454	1,466,818	1,560,336	—114,050
	6 mos.	2,039	49,441,443	6,339,107	60,043,281	5,902,787	16,753,330	810,021	24,746,008	1,708,564	50,195,577	83.60	9,847,704	7,836,437	8,230,881	3,999,908
Chicago & Erie	June	269	1,016,862	83,509	1,179,823	137,120	184,096	22,377	388,180	38,780	771,379	65.40	408,444	355,678	7,328	—121,815
	6 mos.	269	6,130,507	342,424	6,903,598	658,046	1,194,290	124,272	2,727,310	227,760	4,932,218	71.40	1,971,380	1,661,180	—251,162	—593,097
New Jersey & New York	June	45	22,658	106,094	133,819	18,850	19,312	1,378	63,445	3,820	106,805	79.80	27,014	23,525	—5,343	—17,176
	6 mos.	45	155,790	583,236	770,332	84,886	131,718	7,991	421,083	24,323	669,997	87.00	100,325	79,690	—89,105	—67,180
N. Y., Susquehanna & Western	June	135	290,518	59,818	409,169	64,896	65,614	3,589	206,308	12,226	352,633	86.20	56,536	24,208	13,390	—41,797
	6 mos.	135	1,848,757	354,661	2,523,411	298,265	436,947	21,775	1,390,725	73,217	2,220,917	88.00	302,494	113,698	89,530	—57,227
Evansville, Indianapolis & T. H.	June	140	125,628	6,091	138,707	38,903	6,511	1,313	53,044	2,874	94,506	68.10	44,201	39,968	5,492	—58,319
	6 mos.	140	720,846	40,416	802,945	219,235	59,269	10,732	344,917	18,003	642,629	80.00	160,316	134,916	—76,879	—228,232
Florida East Coast	June	764	778,750	243,994	1,154,523	179,140	204,775	10,124	360,551	28,406	790,810	68.50	363,713	248,283	176,933	3,838
	6 mos.	764	5,432,749	2,882,926	9,420,093	1,069,996	1,190,857	88,623	2,621,146	181,216	5,242,030	55.60	4,178,063	3,606,604	3,153,870	2,513,188
Fort Smith & Western	June	249	77,844	22,485	111,166	31,194	21,373	4,928	42,882	7,638	108,890	98.00	2,276	—3,540	—7,607	21,149
	6 mos.	249	572,720	132,606	765,057	151,861	155,120	29,094	277,725	44,025	662,529	86.60	102,528	67,340	36,737	883
Galveston Wharf	June	13	.....	.....	89,550	36,160	4,608	627	27,518	2,948	79,259	88.50	10,291	—6,709	—6,425	—17,230
	6 mos.	13	.....	.....	651,006	209,307	21,296	3,911	185,731	18,274	492,983	75.70	158,023	55,955	57,555	—68,526
Georgia R. R.	June	328	355,317	116,883	505,172	51,857	84,738	20,715	198,504	19,992	376,075	74.40	129,097	121,311	114,439	70,585
	6 mos.	328	2,211,906	614,081	3,014,150	318,278	563,296	125,065	1,290,989	117,986	2,416,188	80.10	597,962	557,752	503,954	302,112

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structures.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Georgia & Florida	June	405	$112,416	$21,205	$142,729	$18,361	$19,806	$8,803	$56,727	$7,272	$111,178	77.90	$31,551	$25,325	$14,655	$21,369
	6 mos.	405	689,424	113,210	851,237	107,258	113,536	49,774	350,843	42,394	665,072	78.10	186,165	147,704	93,325	19,656
Grand Trunk Western	June	347	1,409,533	202,577	1,711,931	186,398	319,663	40,092	587,195	56,522	1,199,617	70.10	512,314	454,408	163,721	234,858
	6 mos.	347	8,238,862	1,060,682	9,844,192	791,541	1,895,692	178,725	3,798,324	293,844	7,001,207	71.10	2,842,985	2,487,475	934,453	—269,484
Atlantic & St. Lawrence	June	126	187,540	19,000	213,645	49,175	62,634	4,074	145,756	7,870	270,384	126.50	—56,739	—71,889	—173,676	—72,413
	6 mos.	166	1,468,538	187,164	1,745,134	295,049	375,806	24,445	1,174,538	47,222	1,922,274	110.10	—177,140	—268,093	—878,815	—495,087
Chic., Det. & Can. Gr. Tr. Junct.	June	59	263,485	10,260	312,611	29,445	14,533	4,126	87,758	4,338	140,200	44.80	172,411	161,087	126,671	10,949
	6 mos.	59	1,482,809	56,361	1,748,292	86,938	114,340	20,451	535,864	21,607	779,140	44.60	969,152	916,074	743,252	366,849
Det., Grand Haven & Milwaukee	June	189	537,878	42,901	642,516	108,958	57,532	11,108	235,235	18,028	431,193	67.10	211,323	208,668	113,038	104,603
	6 mos.	189	2,738,236	249,688	3,299,238	390,672	427,135	52,141	1,538,252	92,106	2,502,565	73.90	796,673	769,486	256,163	171,941
Great Northern	June	8,256	7,714,060	1,440,873	10,193,006	1,958,286	1,997,464	195,734	3,445,446	203,729	7,806,414	76.60	2,386,592	1,704,180	1,814,628	1,830,787
	6 mos.	8,255	40,291,859	7,152,063	52,543,705	7,985,580	12,081,486	939,167	22,934,326	1,236,700	45,263,936	86.10	7,279,769	3,143,223	4,291,270	4,039,579
Green Bay & Western	June	234	96,448	11,524	115,014	22,922	27,789	2,191	44,226	2,337	99,463	86.40	15,551	7,539	5,482	24,929
	6 mos.	234	507,809	90,943	647,622	109,420	139,483	15,249	275,511	16,998	556,442	85.90	91,180	42,804	63,754	90,423
Gulf Coast Lines	June	922	596,015	172,101	824,932	143,309	137,744	27,479	233,387	37,005	576,630	69.90	248,302	197,144	200,733	118,249
	6 mos.	922	4,012,923	978,159	5,319,836	869,451	844,596	168,684	1,495,509	213,477	3,580,990	67.40	1,738,846	1,430,108	1,359,185	1,243,209
Gulf & Ship Island	June	307	196,200	41,328	268,092	48,370	38,776	8,891	82,870	13,582	202,493	75.50	65,599	43,134	35,240	60,777
	6 mos.	307	1,244,853	228,204	1,640,403	273,997	233,192	49,375	486,240	80,769	1,183,829	72.20	456,574	310,101	255,775	259,843
Gulf, Mobile & Northern	June	465	394,975	40,698	454,922	86,317	74,741	16,938	165,572	16,891	359,558	79.00	95,364	67,424	55,240	90,506
	6 mos.	465	2,572,273	238,335	2,922,733	439,438	493,638	101,189	1,042,876	104,382	2,179,213	74.60	743,520	587,143	472,488	464,473
Hocking Valley	June	348	1,541,648	97,535	1,788,789	148,593	519,651	12,440	452,537	40,396	1,173,606	65.60	615,183	533,415	476,946	348,816
	6 mos.	348	7,539,041	547,406	8,632,724	743,851	2,928,662	79,050	2,630,973	212,821	6,590,800	76.30	2,041,924	1,551,453	1,650,224	1,538,478
Illinois Central	June	4,839	10,109,304	2,325,015	13,440,564	2,262,729	3,457,107	191,854	5,059,951	318,543	11,314,654	84.20	2,125,910	1,456,828	1,394,994	1,877,234
	6 mos.	4,839	66,110,167	12,981,878	85,231,508	11,235,295	20,331,324	1,155,130	32,405,805	540,146	67,194,133	78.80	18,037,375	13,176,082	12,704,144	11,357,080
Yazoo & Mississippi Valley	June	1,380	1,206,134	322,258	1,631,796	409,196	372,540	22,822	627,011	44,815	1,470,627	90.10	161,169	50,277	35,867	—26,963
	6 mos.	1,380	7,379,230	1,984,801	9,916,773	2,340,131	2,246,896	139,568	3,968,114	263,336	8,923,859	90.00	992,914	326,535	248,478	142,914
Illinois Cent., G. & M. V. Combined	June	6,219	11,315,438	2,647,273	15,072,360	2,671,925	3,829,647	214,676	5,686,962	363,358	12,785,281	84.80	2,287,079	1,507,105	1,430,861	1,850,271
	6 mos.	6,219	73,489,397	14,966,679	95,148,281	13,575,426	22,578,220	1,294,698	36,373,919	2,158,558	76,117,992	80.00	19,030,289	13,502,617	12,952,622	11,499,994
International & Great Northern	June	1,159	790,870	235,643	1,119,085	240,500	214,265	30,318	430,830	47,049	966,556	86.37	152,529	120,027	99,206	127,489
	6 mos.	1,159	5,028,479	1,162,268	6,828,034	1,306,996	1,314,413	174,397	2,772,061	282,587	5,877,293	86.08	950,741	755,434	545,094	540,442
Kansas City, Mex. & Orient	June	272	108,618	7,864	125,476	35,595	26,706	5,765	64,222	5,779	138,067	110.00	—12,591	—19,874	—23,450	—7,891
	6 mos.	272	684,378	43,147	785,794	187,961	182,740	32,565	401,124	32,397	836,787	106.50	—50,993	—94,750	—74,138	—139,152
Kan. City, Mex. & Orient of Tex.	June	465	125,304	12,967	144,916	35,666	27,052	5,751	64,359	5,384	137,878	95.10	7,038	803	—15,063	—18,757
	6 mos.	465	694,693	57,805	793,406	163,118	214,677	34,028	446,049	33,727	891,205	112.30	—97,799	—135,107	—222,314	—308,663
Kansas City Southern	June	767	1,246,010	208,726	1,617,441	235,785	363,397	41,450	548,329	79,765	1,268,633	78.40	348,808	260,614	214,926	214,682
	6 mos.	767	7,843,376	1,041,552	9,744,263	1,283,616	2,034,673	230,899	3,441,755	422,301	7,411,489	76.10	2,332,774	1,806,274	1,584,864	1,474,942
Texarkana & Fort Smith	June	95	194,627	17,141	230,500	17,125	17,073	5,019	57,321	8,918	105,456	45.80	125,044	113,655	77,308	71,509
	6 mos.	95	1,093,861	88,528	1,304,209	110,274	127,117	30,923	349,235	51,456	668,097	51.20	636,112	567,308	417,661	189,691
Kansas, Oklahoma & Gulf	June	92	164,244	10,880	181,586	41,960	29,973	6,957	76,546	12,802	168,325	92.70	13,260	3,135	—4,830	45,528
	6 mos.	81	1,226,061	66,134	1,337,669	227,006	229,888	41,208	519,529	69,080	1,087,387	81.30	250,282	190,521	95,602	227,417
Lake Superior & Ishpeming	June	33	189,580	31	229,236	23,488	13,892	242	38,456	2,794	78,872	34.40	150,364	143,672	145,740	112,309
	6 mos.	33	366,314	482	438,298	118,520	88,965	1,630	124,239	17,414	350,768	80.00	87,530	43,746	50,467	—52,894
Lake Terminal Tr. R.	June	13	.....	.....	114,922	15,507	19,360	.....	60,189	1,898	96,954	84.40	17,968	11,718	21,198	17,013
	6 mos.	13	.....	.....	570,825	79,245	87,093	.....	334,163	10,504	511,005	89.50	59,820	21,117	42,242	202,041
Lehigh & Hudson River	June	96	247,715	2,588	273,096	27,916	40,371	1,490	51,679	8,323	129,779	47.50	143,317	130,817	111,093	—18,444
	6 mos.	96	1,358,841	19,811	1,457,955	134,132	228,729	9,957	544,782	51,308	968,908	66.50	489,047	419,545	377,535	72,058
Lehigh & New England	June	219	576,824	1,872	587,924	72,846	90,772	5,345	159,917	16,342	354,183	60.20	233,741	201,289	205,372	—27,228
	6 mos.	219	2,969,715	12,205	3,030,621	296,067	813,318	47,278	924,078	102,589	2,182,696	72.00	847,925	718,462	778,974	135,264
Lehigh Valley	June	1,335	5,868,610	680,374	7,052,888	710,653	2,123,581	98,042	2,691,472	134,196	5,788,415	82.10	1,264,473	1,054,963	1,012,023	—32,044
	6 mos.	1,335	30,117,893	3,382,876	36,280,628	3,524,731	12,912,834	574,651	16,223,070	750,656	34,125,271	94.10	2,155,357	897,100	631,720	1,802,808
Los Angeles & Salt Lake	June	1,186	1,389,483	668,231	2,231,757	326,490	486,394	60,548	595,740	58,331	1,574,225	70.50	657,532	544,517	479,055	325,189
	6 mos.	1,172	7,597,290	3,005,153	11,512,048	1,862,389	2,713,347	300,508	3,707,518	504,304	9,135,022	79.40	2,377,026	1,697,426	1,461,021	450,497
Louisiana & Arkansas	June	302	201,209	32,998	241,827	52,236	41,181	7,028	87,220	8,543	195,324	80.80	46,503	29,028	27,416	100,948
	6 mos.	302	1,695,976	194,508	1,938,963	285,781	256,756	46,817	597,984	51,995	1,236,482	63.80	702,481	538,498	496,079	312,076
Louisiana Ry. & Nav. Co.	June	343	258,341	30,423	304,945	55,100	69,932	10,096	136,738	10,639	282,468	92.60	22,477	5,127	—12,512	—16,756
	6 mos.	343	1,690,454	180,236	1,973,335	383,535	394,651	62,970	803,307	66,462	1,710,141	86.70	263,194	158,558	27,695	—99,777
Louisiana Ry. & Nav. Co. of Tex.	June	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	6 mos.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Louisville & Nashville	June	5,049	8,115,867	2,331,627	11,220,169	1,603,411	2,899,887	227,516	4,187,816	251,425	9,220,047	82.20	2,000,122	1,498,974	1,421,238	2,619,409
	6 mos.	5,041	50,281,378	12,176,888	66,622,895	8,455,110	16,676,667	1,395,931	25,158,753	1,420,224	53,372,843	80.10	13,250,052	10,371,018	10,734,319	9,839,446
Louisville, Henderson & St. Louis	June	199	190,178	64,996	273,418	60,197	39,892	6,865	88,348	10,202	205,505	75.20	67,913	63,125	53,663	44,405
	6 mos.	199	1,224,687	366,285	1,701,815	336,231	226,474	38,782	566,913	53,916	1,222,316	71.80	479,499	418,017	334,505	239,628
Maine Central	June	1,201	1,267,329	450,958	1,879,980	297,092	310,681	18,177	789,386	47,438	1,466,133	78.00	413,847	315,111	284,636	253,680
	6 mos.	1,201	7,363,668	2,231,963	10,404,530	1,742,368	1,906,493	83,396	5,092,699	286,086	9,118,003	87.60	1,286,527	695,878	500,268	973,879
Midland Valley	June	365	271,110	59,768	349,593	91,747	52,699	4,933	102,434	18,488	254,128	72.70	95,465	79,297	70,085	167,184
	6 mos.	365	1,749,283	369,931	2,224,158	356,691	312,314	30,922	701,858	110,096	1,484,618	66.70	739,540	646,864	587,843	784,270
Minneapolis & St. Louis	June	1,649	1,047,414	139,219	1,267,440	196,523	297,399	26,797	570,053	40,907	1,130,368	89.20	137,072	73,204	67,380	65,468
	6 mos.	1,649	6,836,425	882,349	8,150,427	1,068,653	1,899,947	153,280	3,103,576	265,593	7,088,541	87.00	1,061,886	657,943	531,618	267,423

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Minneapolis, St. Paul & S. S. Marie.	June	4,402	$3,217,170	$706,780	$4,315,127	$565,182	$716,356	$58,328	$1,603,670	$103,718	$3,086,791	71.50	$1,228,336	$963,673	$954,189	$844,525
	6 mos.	4,390	18,227,431	3,576,548	23,652,491	3,010,389	4,381,308	345,778	10,657,748	650,781	19,126,299	80.90	4,526,192	2,956,946	2,949,655	510,322
Mississippi Central	June	257	127,434	15,530	148,268	39,667	30,587	5,724	48,709	7,527	132,197	89.20	16,071	11,069	10,008	12,440
	6 mos.	257	794,999	89,941	916,664	178,497	151,445	33,558	308,447	42,733	714,663	78.00	202,001	169,911	152,673	54,743
Missouri & North Arkansas	June	364	84,163	21,454	110,672	26,183	18,207	4,246	44,768	6,491	99,895	9.00	10,777	6,572	2,209	2,629
	6 mos.	364	537,081	119,292	698,665	132,686	96,092	18,966	322,874	40,583	601,201	9.00	97,464	72,410	12,562	—5,578
Missouri-Kansas-Texas	June	1,882	1,931,316	526,357	2,699,884	325,767	729,021	49,760	749,892	89,197	1,952,860	72.30	747,024	568,531	738,804	811,868
	6 mos.	1,941	12,357,848	2,886,742	16,755,533	1,537,477	5,079,966	312,195	5,171,134	678,406	12,812,057	76.50	3,943,476	2,997,180	3,834,727	4,280,423
Mo.-Kansas-Texas of Texas	June	1,389	897,374	447,066	1,484,248	215,570	315,602	40,744	586,752	59,375	1,224,862	82.50	259,386	212,769	46,488	206,070
	6 mos.	1,564	5,912,654	2,420,599	9,288,977	1,220,875	2,902,843	243,733	4,043,858	473,324	8,038,835	86.50	1,250,142	937,772	—233,810	1,055,156
Missouri, Kansas & Texas	June	Second class road effective June 1, 1923														
	6 mos.															
Wichita Falls & Northwestern	June															
	6 mos.															
Missouri Pacific	June	7,171	6,752,639	1,620,393	9,195,092	1,525,600	2,700,291	155,082	3,504,549	293,900	8,239,468	89.60	955,624	568,778	488,695	922,261
	6 mos.	7,171	40,061,340	8,889,858	53,698,273	7,444,320	14,449,862	923,456	21,889,146	1,619,007	46,615,862	86.80	7,082,411	4,827,871	3,258,543	3,456,098
Mobile & Ohio	June	1,165	1,307,487	159,516	1,560,303	190,105	360,911	47,540	575,989	48,072	1,222,286	78.30	338,017	260,571	214,598	230,500
	6 mos.	1,165	8,859,634	938,612	10,362,099	1,228,810	2,356,149	275,732	3,776,801	279,350	7,916,826	76.40	2,445,273	1,905,233	1,659,192	1,269,650
Monongahela	June	106	507,899	35,922	549,516	62,859	116,601	1,121	152,430	9,771	342,782	62.40	206,734	196,744	102,042	—27,619
	6 mos.	106	2,588,549	231,326	2,850,203	327,739	603,667	6,764	892,137	54,909	1,885,216	66.10	964,987	905,247	461,644	441,229
Monongahela Connecting	June	7			240,758	29,704	45,973	562	114,094	5,243	195,576	81.20	45,182	42,425	21,811	26,878
	6 mos.	7			1,353,266	156,631	225,056	3,420	699,217	28,989	1,113,313	82.30	239,953	225,779	96,397	193,390
Montour	June	57	266,317	422	269,704	44,450	54,113	1,189	42,789	7,128	149,669	55.50	120,035	99,899	124,114	—23,993
	6 mos.	57	1,168,498	3,065	1,186,792	180,131	291,992	6,703	236,004	42,517	757,347	63.80	429,445	350,436	518,912	—5,464
Nashville, Chattanooga & St. Louis.	June	1,258	1,415,580	427,754	2,009,347	377,067	520,801	73,432	742,917	61,228	1,776,230	88.40	233,117	172,976	228,911	229,092
	6 mos.	1,258	9,037,339	2,392,411	12,258,770	1,803,407	2,795,394	448,452	4,771,910	369,026	10,218,142	83.40	2,040,628	1,677,293	1,898,371	992,080
Nevada Northern	June	165	84,465	10,044	100,014	11,865	5,405	599	14,985	3,477	36,331	36.30	63,683	57,073	56,697	21,760
	6 mos.	165	361,565	51,046	443,121	70,246	33,336	3,019	84,724	20,030	211,355	47.60	231,766	192,156	199,962	33,023
Newberg & South Shore	June	7			171,588	29,666	59,581		68,381	4,059	164,788	96.00	6,800	—5,986	—10,246	31,228
	6 mos.	7			1,061,090	96,503	307,703		462,989	25,746	896,235	84.50	164,855	91,152	37,722	242,871
New Orleans Great Northern	June	274	201,592	36,689	247,927	32,222	44,668	6,167	69,780	10,047	163,481	65.90	84,446	67,437	68,714	81,019
	6 mos.	274	1,173,724	187,286	1,412,000	181,506	228,798	34,641	424,252	64,675	936,550	66.30	475,450	375,249	377,305	229,244
New York Central	June	6,899	24,261,951	9,545,821	38,145,470	4,266,447	9,157,952	297,719	11,577,131	867,163	26,542,444	69.58	11,603,026	9,311,867	8,963,584	5,404,347
	6 mos.	6,897	143,309,176	46,308,621	213,676,256	21,877,372	51,672,600	1,890,706	77,382,361	4,992,687	160,091,044	74.92	53,585,212	41,197,809	39,679,191	25,579,485
Cincinnati Northern	June	244	391,455	13,410	412,159	87,047	68,881	4,555	127,049	7,211	294,096	71.40	118,063	99,694	48,730	43,321
	6 mos.	244	2,543,178	80,403	2,665,794	417,183	437,142	27,566	900,676	44,077	1,825,842	68.50	839,952	707,023	452,136	225,891
Clev., Cin., Chicago & St. Louis.	June	2,407	5,613,212	1,708,165	7,966,671	1,060,211	1,578,615	89,302	2,720,612	185,066	5,680,680	71.30	2,286,591	1,821,274	1,776,848	1,827,437
	6 mos.	2,408	35,537,935	8,475,747	47,859,673	4,953,244	10,920,198	626,954	17,543,562	1,089,409	35,423,325	74.00	12,436,348	9,809,697	9,405,841	8,409,775
Indiana Harbor Belt	June	119			960,497	120,740	128,447	3,750	370,501	22,016	645,454	67.20	315,043	280,430	142,361	154,097
	6 mos.	119			5,806,988	587,864	785,068	26,020	2,610,807	126,933	4,136,692	71.20	1,670,296	1,502,164	761,613	995,181
Michigan Central	June	1,862	5,248,440	2,124,139	8,166,682	983,099	1,449,662	120,969	2,495,859	144,929	5,316,102	65.10	2,850,580	2,324,166	2,119,456	2,186,713
	6 mos.	1,862	33,903,482	9,785,553	48,336,062	4,992,521	9,158,682	584,490	16,369,958	868,106	32,411,331	67.10	15,924,731	13,011,805	11,528,728	7,724,486
Pittsburg & Lake Erie	June	231	3,957,065	266,795	4,339,900	437,304	913,459	17,865	1,033,188	63,080	2,466,515	56.80	1,873,385	1,583,968	1,887,890	351,726
	6 mos.	231	20,841,634	1,552,927	22,865,939	2,149,444	5,607,787	116,054	6,482,319	377,550	14,743,280	64.40	8,122,559	6,677,607	8,912,221	156,328
New York, Chicago & St. Louis	June	1,242	3,473,337	179,130	3,813,741	433,156	865,393	89,443	1,288,626	132,321	2,817,744	73.90	995,997	806,398	734,767	636,036
	6 mos.	1,242	20,755,633	822,104	22,456,750	2,311,244	4,746,945	508,975	8,529,664	770,419	16,909,939	75.30	5,546,811	4,407,420	3,872,979	3,651,729
New York, New Haven & Hartford.	June	2,000	6,393,627	4,239,837	11,949,570	1,556,343	2,750,556	61,697	4,400,703	292,021	9,240,100	77.30	2,709,470	2,271,375	1,620,623	851,795
	6 mos.	2,000	34,037,675	23,954,577	65,983,463	7,168,876	15,933,151	339,711	27,961,012	1,699,430	54,136,069	82.00	11,847,394	9,326,770	3,931,029	6,895,556
Central New England	June	295	705,922	13,678	748,555	116,593	149,367	4,918	228,466	10,845	510,189	68.20	238,366	214,267	189,291	—29,583
	6 mos.	295	3,422,490	97,879	3,670,252	600,075	819,409	27,234	1,464,858	63,315	2,974,891	81.10	695,361	552,892	132,196	613,984
New York, Ontario & Western	June	569	749,700	293,237	1,248,667	208,208	250,000	15,670	503,359	32,484	1,009,928	80.90	238,739	196,203	172,238	—7,647
	6 mos.	569	4,413,122	969,591	6,393,439	826,135	1,500,000	90,205	3,342,624	194,990	5,959,473	93.20	433,966	178,399	—50,669	240,019
Norfolk & Western	June	2,237	6,657,729	908,253	7,881,048	1,088,523	2,066,659	81,760	2,613,916	165,617	6,025,069	76.50	1,855,979	1,304,034	1,589,249	3,403,803
	6 mos.	2,237	38,272,918	4,767,519	44,938,946	5,883,355	11,926,923	483,859	15,842,977	928,070	35,172,086	78.30	9,766,860	6,814,339	8,892,633	13,574,542
Norfolk Southern	June	931	608,766	123,819	780,987	104,702	124,743	24,353	309,079	30,709	594,100	76.10	186,887	148,439	112,309	131,051
	6 mos.	931	3,728,733	654,774	4,642,461	598,506	710,827	139,430	1,937,983	175,763	3,565,512	76.80	1,076,949	846,497	591,441	471,505
Northern Pacific	June	6,665	5,864,273	1,656,475	8,302,287	1,780,803	1,948,824	203,143	3,024,297	223,146	7,256,427	87.40	1,045,860	340,751	691,940	1,581,454
	6 mos.	6,665	34,948,307	7,475,365	46,647,127	7,051,439	12,096,616	1,046,739	19,484,460	1,295,444	41,489,965	88.90	5,157,162	969,170	3,921,643	2,718,239
Northwestern Pacific	June	496	377,299	276,181	720,812	98,488	96,168	10,850	236,269	17,649	459,433	63.70	261,379	211,908	202,324	197,530
	6 mos.	496	2,016,915	1,207,766	3,576,525	676,429	612,705	43,316	1,366,783	110,762	2,818,471	78.80	758,054	463,103	398,745	488,973
Pennsylvania	June	10,478	45,636,211	13,461,271	64,387,849	8,615,127	16,574,319	648,293	23,756,018	1,487,262	51,934,851	80.70	12,452,998	9,257,360	7,938,580	5,672,482
	6 mos.	10,478	249,962,265	74,368,532	356,130,371	38,496,366	94,451,386	3,754,219	142,719,739	8,637,026	292,935,889	82.30	63,194,482	49,123,198	41,486,060	41,765,131
Baltimore, Chesapeake & Atlantic.	June	87	88,323	39,418	133,240	15,226	47,998	1,585	87,276	4,296	156,381	117.40	—23,141	—28,013	—27,531	21,921
	6 mos.	87	462,311	161,491	652,883	75,519	276,687	10,547	455,104	23,997	841,854	128.90	—188,971	—200,657	—199,788	—91,379
Long Island	June	397	859,938	2,103,995	3,229,094	367,927	483,181	18,092	1,221,258	75,034	2,179,018	67.50	1,050,076	822,588	496,640	730,123
	6 mos.	397	5,192,253	9,052,038	15,631,133	1,881,559	2,948,148	105,625	7,225,469	386,706	12,642,994	80.90	2,988,139	2,345,690	1,317,632	1,936,916
Maryland, Delaware & Virginia	June	82	66,233	25,535	95,008	9,656	43,927	1,266	67,094	2,783	124,726	131.30	—29,718	—31,901	—33,857	—13,754
	6 mos.	82	358,203	109,838	468,290	48,579	186,958	7,889	361,047	14,523	618,996	132.20	—150,706	—155,908	—163,051	—113,964

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
West Jersey & Seashore	June	359	$435,088	$698,343	$1,230,752	$240,951	$236,915	$16,427	$532,334	$26,596	$1,063,942	86.40	$166,810	$57,094	$36,521	$17,028
	6 mos.	359	2,568,742	3,144,827	6,232,507	1,186,581	1,226,390	78,911	2,985,202	154,120	5,702,721	91.50	529,786	302,083	177,761	186,664
Pere Marquette	June	2,221	3,025,385	498,075	3,895,209	553,054	716,474	52,317	1,398,758	113,096	2,823,074	72.70	1,062,133	921,253	802,809	709,448
	6 mos.	2,214	17,748,606	2,450,220	22,264,618	2,331,929	4,840,693	297,174	8,633,277	648,445	16,771,201	75.30	5,493,417	4,679,580	3,451,811	2,626,684
Philadelphia & Reading	June	1,125	7,593,400	893,372	8,959,203	855,603	1,870,886	78,162	3,041,318	152,387	6,016,078	67.10	2,943,125	2,681,006	2,544,385	5,582,788
	6 mos.	1,125	47,116,550	5,148,008	55,077,844	4,124,957	11,099,484	483,857	19,571,938	886,331	36,283,841	65.90	18,794,003	17,192,283	15,938,308	28,663
Atlantic City	June	170	129,923	343,852	491,298	70,159	39,027	9,713	216,258	9,906	345,241	70.30	146,057	126,066	82,755	—132,483
	5 mos.	170	731,670	1,090,054	1,904,927	355,025	226,761	35,003	1,223,964	31,181	1,871,370	98.20	33,557	—86,704	—286,700	
Perkiomen	June	41	95,976	8,097	107,240	10,167	4,451	111	46,781	848	62,398	58.20	44,842	38,709	33,115	50,858
	6 mos.	41	478,129	40,051	540,654	43,883	24,135	650	256,699	4,869	330,425	61.10	210,229	171,969	143,966	180,373
Port Reading	June	21	145,603	.....	203,178	24,928	3,121	229	70,583	2,155	101,014	49.70	102,164	89,118	26,694	—41,010
	6 mos.	21	1,167,177	.....	1,513,211	103,141	46,248	1,374	552,414	12,949	716,121	47.30	797,090	714,728	290,695	67,251
Pittsburg & Shawmut	June	102	93,969	3,194	100,190	23,398	49,641	1,429	33,673	6,178	114,319	114.10	—14,129	—14,241	27,293	—54,397
	6 mos.	102	663,697	32,094	711,908	128,140	287,317	9,797	265,086	38,286	728,626	102.30	—16,718	—17,552	203,532	—36,865
Pittsburg & West Virginia	June	89	268,242	9,119	310,230	48,545	95,774	3,478	79,337	13,497	249,017	80.30	61,213	22,270	100,091	66,153
	6 mos.	89	1,570,920	55,153	1,816,941	206,548	525,761	20,181	491,086	90,544	1,391,472	76.60	425,469	180,898	698,995	378,770
Peoria & Pekin Union	June	19	20,673	2,384	131,897	35,394	1,368	404	58,783	9,788	105,737	80.20	26,160	13,660	35,247	20,150
	6 mos.	19	127,515	17,248	877,166	135,093	89,739	2,669	381,555	56,445	665,501	75.90	211,565	136,665	288,067	251,718
Pittsburg, Shawmut & Northern	June	210	95,116	4,461	103,722	42,170	35,498	1,805	45,999	6,740	132,205	127.50	—28,485	—30,784	—13,168	—31,194
	6 mos.	210	703,498	42,562	764,967	171,456	243,874	10,819	327,741	39,271	793,161	103.70	—28,104	—42,752	76,458	139,605
Quincy, Omaha & Kansas City	June	250	57,462	21,581	88,906	46,154	21,629	844	42,881	2,247	113,456	127.60	—24,550	—28,655	—34,350	833
	6 mos.	250	472,261	129,641	651,493	235,041	133,223	4,976	348,348	13,989	733,767	112.60	—82,274	—110,057	—149,586	—68,657
Rich., Fredericksburg & Potomac	June	117	605,631	335,128	1,092,468	105,936	35,498	8,018	355,115	30,110	660,118	60.40	432,350	362,662	307,243	231,426
	6 mos.	117	3,222,214	2,193,867	6,464,790	573,433	243,874	52,427	2,279,141	174,804	4,087,810	63.20	2,376,980	2,014,497	1,606,469	1,210,844
Rutland	June	413	325,614	122,547	575,777	116,605	106,561	8,475	233,716	12,142	479,188	83.01	96,589	70,835	67,172	19,707
	6 mos.	413	2,006,142	698,080	3,326,339	559,193	613,899	50,541	1,524,518	75,598	2,832,872	85.20	493,467	352,860	415,124	129,340
St. Louis-San Francisco	June	4,751	4,468,360	1,785,550	6,764,804	1,045,341	1,193,842	92,298	2,491,288	212,699	4,995,635	73.80	1,769,169	1,415,143	1,423,408	1,861,468
	6 mos.	4,751	29,162,424	9,404,232	41,720,727	4,771,559	8,360,997	545,627	15,649,232	1,147,293	30,223,287	72.40	11,497,440	9,497,301	9,188,567	8,468,956
Ft. Worth & Rio Grande	June	235	101,167	28,402	137,832	31,585	20,192	3,189	52,077	6,252	113,295	82.20	24,537	19,520	12,653	—38,757
	6 mos.	235	463,190	155,545	675,735	160,982	148,135	18,390	346,244	35,642	700,791	103.70	—25,056	—49,057	—99,845	—215,450
St. Louis, San Francisco & Texas	June	134	113,384	12,577	130,980	31,907	19,684	3,735	52,294	6,153	113,762	86.90	17,218	15,146	—1,303	—16,270
	6 mos.	134	616,632	80,371	733,009	165,073	131,400	22,959	326,747	48,544	694,359	94.70	38,650	25,712	—98,757	—99,525
St. Louis, Southwestern	June	968	1,227,064	162,721	1,468,197	155,735	286,859	42,422	380,069	50,571	924 156	62.90	544,041	456,044	443,168	472,754
	6 mos.	968	9,012,581	920,547	10,446,172	1,169,820	1,978,590	261,459	2,738,015	314,725	6,515,379	62.40	3,930,793	3,404,235	3,050,408	2,429,093
St. Louis, Southwestern of Texas	June	807	468,327	112,474	637,195	125,593	243,112	20,843	278,934	30,878	697,449	109.40	—60,254	—87,664	—58,143	—65,973
	6 mos.	807	2,872,916	587,078	3,735,734	831,307	1,478,031	121,856	2,007,155	188,256	4,623,622	123.70	—887,888	—1,050,235	—927,607	—879,085
San Antonio & Aransas Pass	June	739	338,672	67,020	445,015	95,641	128,755	10,302	175,641	22,517	431,067	96.90	13,948	—1,986	3,264	—38,484
	6 mos.	739	1,878,661	373,677	—2,451,816	605,252	752,100	64,580	1,089,634	142,242	2,646,278	107.90	—194,462	—288,407	—222,657	—352,391
San Antonio, Uvalde & Gulf	June	317	84,580	17,049	110,167	15,094	13,956	4,141	40,545	29,448	103,158	93.60	7,009	3,785	—6,286	—8,523
	6 mos.	317	438,591	102,295	597,070	92,756	84,847	22,729	245,292	63,456	508,792	85.20	88,278	68,002	12,853	15,364
Seaboard Air Line	June	3,577	2,870,427	766,134	4,076,170	601,982	717,531	125,616	1,537,254	165,988	3,182,129	78.10	894,041	718,468	626,457	449,610
	6 mos.	3,576	19,014,010	5,239,003	26,915,345	3,410,700	4,689,469	863,400	10,817,889	1,004,571	21,026,408	78.10	5,888,937	4,833,800	3,501,626	2,031,037
Southern Ry. Co	June	6,971	8,533,421	3,102,991	12,585,968	1,806,925	2,445,844	236,727	4,487,920	328,906	9,418,056	74.80	3,167,912	2,581,552	2,254,444	2,420,736
	6 mos.	6,971	53,089,718	15,922,706	74,448,970	10,203,993	13,900,282	1,360,885	28,127,307	1,887,965	56,007,362	75.20	18,441,608	15,152,468	13,432,478	8,877,426
Alabama Great Southern	June	318	643,669	202,523	896,388	121,102	189,983	20,760	292,087	23,813	654,362	73.00	242,026	188,760	163,928	187,440
	6 mos.	318	4,125,679	970,455	5,392,914	625,592	979,930	121,533	1,802,653	145,293	3,708,694	68.80	1,684,220	1,359,469	1,344,882	990,614
Cin., New Orleans & Texas Pac	June	338	1,466,275	417,205	1,971,729	270,196	450,141	36,827	640,425	48,170	1,457,643	73.90	514,086	414,086	300,686	294,908
	6 mos.	338	9,223,983	2,114,946	11,863,271	1,376,113	2,590,475	207,166	3,706,092	276,789	8,223,021	69.30	3,640,250	3,022,658	2,615,003	1,586,004
Georgia, Southern & Florida	June	402	322,646	108,071	460,834	81,033	79,974	9,328	169,757	11,399	353,804	76.80	107,030	87,687	50,337	49,604
	6 mos.	402	1,730,001	682,006	2,621,498	415,268	419,414	52,861	1,070,579	67,829	2,044,387	78.00	577,111	457,433	265,687	187,240
New Orleans & Northeastern	June	207	401,309	95,544	554,771	88,761	114,338	10,814	210,287	152,276	443,727	80.00	111,044	60,969	52,811	71,290
	6 mos.	207	2,644,551	495,729	3,504,981	479,293	660,109	64,718	1,291,037	92,039	2,608,693	74.40	896,288	587,493	536,124	233,959
Northern Alabama	June	110	120,195	12,743	135,907	21,885	7,240	2,220	47,879	3,189	82,413	60.60	53,494	45,516	19,102	6,106
	6 mos.	110	746,230	75,983	839,434	139,540	38,054	12,331	289,268	20,564	499,757	59.50	339,667	298,658	165,468	70,092
Southern Pacific	June	7,120	12,176,359	4,204,087	18,178,291	2,321,451	2,897,430	245,508	5,497,626	557,534	11,787,781	64.90	6,390,510	5,081,636	4,635,895	4,305,135
	6 mos.	7,117	62,339,299	22,135,900	93,803,696	13,109,041	16,985,630	1,637,651	30,560,780	2,784,726	66,665,396	71.10	27,138,300	19,494,440	18,477,738	13,472,784
Arizona Eastern	June	382	256,702	27,653	301,899	32,550	49,615	3,683	76,069	19,742	182,851	60.60	119,048	107,662	121,068	84,803
	6 mos.	382	1,567,865	180,900	1,846,706	236,326	283,482	18,257	459,535	110,142	1,114,589	60.40	732,117	586,074	536,035	369,103
Atlantic Steamship Lines	June	....	1,011,410	74,486	1,126,537	14,452	169,187	26,482	675,547	30,918	920,586	81.70	205,951	194,554	194,554	125,522
	6 mos.	....	6,151,821	359,005	6,818,920	88,910	1,011,339	128,711	4,115,563	169,272	5,513,795	80.90	1,305,125	1,236,527	1,236,137	1,026,132

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1923—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1922.
Galveston, Harrisb'g & San Ant.	June	1,379	$1,288,891	$455,129	$1,863,224	$396,191	$387,842	$37,237	$724,719	$70,845	$1,624,741	87.20	$238,483	$181,678	$166,495	$288,935
	6 mos.	1,379	7,811,446	2,466,454	10,939,915	2,333,493	2,324,547	257,499	4,371,462	425,417	9,698,174	88.60	1,241,741	879,462	668,418	952,210
Houston & Texas Central	June	923	695,685	274,499	1,039,363	256,052	244,482	25,354	396,257	47,001	968,238	93.20	71,125	53,219	16,776	127,585
	6 mos.	923	4,465,383	1,514,322	6,426,020	1,465,771	1,466,717	152,688	2,473,101	277,744	5,823,882	90.60	602,138	313,437	86,438	863,886
Houston, E. & W. Texas	June	191	166,700	48,537	227,896	55,385	62,468	3,588	84,691	9,533	215,658	94.60	12,238	1,441	—9,356	38,015
	6 mos.	191	1,069,426	257,165	1,405,099	342,350	344,662	20,889	565,339	52,817	1,322,769	94.10	82,330	—28,893	—41,450	52,153
Louisiana Western	June	207	237,330	103,639	363,489	60,632	73,735	9,803	102,603	16,862	268,051	73.70	95,438	62,783	67,501	69,229
	6 mos.	207	1,613,097	527,799	2,295,902	381,294	434,499	58,209	672,900	101,507	1,671,854	72.80	624,048	441,325	435,461	364,370
Morgan's L. & T. R. & SS. Co.	June	400	447,639	165,330	663,799	161,936	154,841	16,505	273,511	31,119	641,400	96.60	22,399	—24,667	—42,108	—14,945
	6 mos.	400	3,111,149	921,702	4,377,288	992,371	940,200	98,594	1,730,557	186,788	3,958,857	90.40	418,431	140,776	—9,276	—144,048
Texas & New Orleans	June	507	500,445	176,852	719,849	190,755	171,409	10,524	248,419	25,784	650,882	90.40	68,967	40,220	30,287	—54,233
	6 mos.	507	3,094,847	946,154	4,334,389	1,146,033	1,042,578	77,716	1,583,985	153,430	4,021,727	92.80	312,662	140,381	35,352	173,365
Spokane International	June	165	65,575	15,670	86,032	17,022	10,548	3,346	32,714	6,014	70,473	81.90	15,559	9,699	1,127	19,301
	6 mos.	165	453,476	97,024	582,661	85,062	64,010	19,358	222,415	35,393	431,097	74.00	151,564	116,613	69,925	68,793
Spokane, Portland & Seattle	June	554	438,721	158,420	653,319	97,593	120,759	11,361	193,617	17,611	452,219	69.20	201,100	126,080	81,831	198,222
	6 mos.	554	2,675,707	781,147	3,814,523	458,777	672,587	57,722	1,179,925	105,747	2,545,505	66.70	1,269,018	818,518	709,101	616,869
Tennessee Central	June	287	185,337	48,342	247,664	40,456	46,638	6,463	91,122	9,815	194,412	78.50	53,252	45,571	33,725	15,664
	6 mos.	287	1,213,240	253,024	1,547,459	234,663	258,376	35,584	594,135	58,392	1,180,624	76.30	366,835	333,180	220,870	79,644
Term. Ry. Asso. of St. Louis	June	37	.....	.....	419,466	95,220	44,177	962	135,409	12,053	291,502	69.50	127,964	60,391	162,368	191,540
	6 mos.	37	.....	.....	2,499,518	526,840	230,786	5,934	838,537	43,884	1,667,176	66.70	832,342	456,011	1,168,937	1,183,716
East St. Louis Connect	June	1	.....	.....	172,519	12,179	6,885	275	61,467	3,891	84,697	49.00	87,822	71,752	51,505	76,322
	6 mos.	1	.....	.....	1,173,855	72,843	31,269	1,694	382,463	15,401	503,670	42.90	670,185	584,729	466,960	406,703
St. Louis Merch. Bridge Ter.	June	9	.....	.....	348,238	36,754	29,089	889	184,809	10,987	262,528	75.40	85,710	53,521	45,480	67,347
	6 mos.	9	.....	.....	2,473,195	266,141	169,624	5,452	1,156,725	42,545	1,640,487	66.30	832,708	642,139	602,662	511,075
St. Louis Transfer Ry.	June	6	.....	.....	59,793	5,196	4,122	160	35,674	1,830	46,982	78.60	12,811	11,945	7,197	1,792
	6 mos.	6	.....	.....	417,484	29,096	22,725	985	224,313	7,855	284,974	68.30	132,510	130,195	93,356	24,967
Texas & Pacific	June	1,952	1,536,769	631,675	2,365,017	364,516	582,933	51,542	874,787	89,276	1,983,370	83.90	381,647	278,728	235,794	401,847
	6 mos.	1,952	10,262,796	3,481,540	14,963,007	2,124,417	4,022,231	300,699	5,786,697	556,040	12,888,322	86.10	2,074,685	1,460,326	828,478	1,180,306
Toledo, Peoria & Western	June	247	88,932	38,149	143,085	35,017	45,473	3,040	69,688	7,476	160,694	112.30	—17,609	—28,609	—29,181	—15,012
	6 mos.	247	560,102	256,530	900,273	167,442	291,048	15,586	466,659	44,418	985,085	109.40	—84,812	—150,946	—125,954	—120,078
Toledo, St. Louis & Western	June	454	961,661	37,280	1,047,983	147,547	151,863	21,117	299,569	22,290	642,358	61.30	405,625	338,266	295,529	230,041
	6 mos.	454	6,085,921	183,019	6,563,956	758,964	891,898	127,327	1,980,968	125,293	3,884,397	59.20	2,679,559	2,243,579	1,886,173	1,185,551
Trinity & Brazos Valley	June	368	121,492	16,988	135,197	40,241	35,847	2,818	52,670	11,230	142,363	105.30	—7,166	—10,694	—24,026	—25,290
	6 mos.	368	647,565	96,353	772,542	180,918	186,862	19,603	364,394	65,821	812,482	105.10	—39,640	—81,142	—179,951	—147,473
Ulster & Delaware	June	128	84,883	42,975	168,216	22,472	24,867	4,022	81,428	8,267	141,056	83.80	27,160	21,158	15,914	6,472
	6 mos.	128	426,586	145,069	792,132	106,983	139,156	14,485	390,190	47,580	699,337	88.20	92,795	56,768	29,053	—15,573
Union R. R. of Penna.	June	45	.....	.....	1,237,322	68,166	262,480	182	489,414	8,462	828,704	67.00	408,618	327,618	428,099	503,097
	6 mos.	45	.....	.....	5,982,517	371,943	1,239,983	1,046	2,872,950	45,971	4,531,837	75.70	1,451,680	1,181,555	1,732,071	1,679,158
Union Pacific	June	3,708	6,181,292	1,780,482	8,877,619	1,568,249	1,961,599	193,312	2,511,677	277,165	6,727,430	75.80	2,150,189	1,586,820	1,441,301	1,934,588
	6 mos.	3,708	37,899,957	8,335,779	50,958,437	6,304,148	11,613,703	883,666	15,210,316	1,601,080	36,604,504	71.80	14,353,933	10,966,939	11,039,475	9,552,999
Oregon Short Line	June	2,366	2,162,402	543,119	2,947,282	583,340	587,543	51,727	879,118	109,004	2,280,173	77.40	667,109	415,171	353,742	251,106
	6 mos.	2,366	13,619,100	2,520,796	17,417,087	2,879,785	3,641,276	268,183	5,666,251	643,213	13,430,244	77.10	3,986,843	2,473,489	2,267,396	2,157,448
Oreg. & Wash. R. R. & Nav. Co.	June	2,238	1,529,925	574,873	2,333,292	535,973	419,336	69,022	935,352	114,064	2,096,075	89.80	237,217	58,706	—44,774	—245,210
	6 mos.	2,237	9,495,543	2,680,023	13,379,455	2,702,348	2,587,886	370,736	6,020,026	698,223	12,499,360	93.40	880,095	—132,393	—563,380	—1,162,794
St. Joseph & Grand Island	June	258	189,251	27,792	235,888	68,388	59,749	2,641	100,137	11,584	242,499	102.80	—6,611	—19,778	—35,308	—39,708
	6 mos.	258	1,321,416	149,565	1,570,857	267,156	311,047	15,135	703,749	72,858	1,371,551	87.30	199,306	120,044	39,908	39,115
Utah	June	102	138,676	465	139,929	32,061	36,505	398	33,890	5,347	107,590	76.90	32,339	26,395	20,877	34,489
	6 mos.	102	728,477	3,650	737,505	118,535	224,665	2,135	206,082	31,982	582,998	79.10	154,507	114,133	80,929	123,989
Virginian	June	540	1,603,212	77,609	1,791,452	173,527	402,532	11,875	468,058	41,891	1,097,898	61.30	693,554	594,194	626,527	884,215
	6 mos.	540	10,001,877	433,832	11,073,336	1,030,776	2,377,729	70,152	2,931,704	211,700	6,628,327	59.90	4,444,009	3,830,411	4,063,238	3,833,222
Wabash	June	2,472	4,133,718	924,083	5,558,770	895,212	1,135,426	124,137	2,005,974	168,644	4,358,558	78.40	1,200,212	1,011,389	814,461	800,946
	6 mos.	2,472	24,917,223	4,404,185	31,784,135	4,195,259	6,774,811	713,068	12,260,396	920,365	24,993,946	78.60	6,790,189	5,642,951	4,144,758	2,430,437
Western Maryland	June	804	1,918,589	81,322	2,084,417	272,120	562,089	36,572	684,221	45,445	1,617,057	77.60	467,360	377,360	397,472	260,390
	6 mos.	804	10,676,610	442,960	11,730,940	1,319,947	3,099,283	214,239	4,165,607	268,398	9,176,920	78.20	2,554,020	2,089,020	2,270,683	1,488,077
Western Pacific	June	1,043	888,466	273,050	1,263,893	219,921	205,619	36,639	410,346	34,882	938,888	74.30	325,005	244,079	275,764	179,477
	6 mos.	1,043	4,386,787	1,016,330	5,881,812	936,781	1,177,036	204,047	2,142,809	203,686	4,764,938	81.00	1,116,874	650,703	1,004,436	284,711
Wheeling & Lake Erie	June	511	1,704,197	62,389	1,910,179	232,287	542,098	16,623	554,955	42,285	1,391,650	72.90	518,529	390,832	339,550	267,284
	6 mos.	511	7,642,871	354,023	8,667,135	925,514	2,659,748	92,294	2,908,505	208,649	6,813,994	78.60	1,853,141	1,208,625	994,375	932,141
For May, 1923—																
Atlantic & St. Lawrence	May	166	192,444	34,000	242,694	58,212	57,776	4,808	141,670	9,173	272,869	112.00	—32,067	—47,217	—102,217	—103,897
	5 mos.	166	1,280,998	168,164	1,531,489	245,874	313,172	20,371	1,028,782	39,352	1,651,890	107.80	—123,193	—195,956	—707,581	—452,084

Traffic News

Beginning August 15 the Missouri Pacific will sell through tickets from St. Louis to points in Mexico via Laredo, Tex.

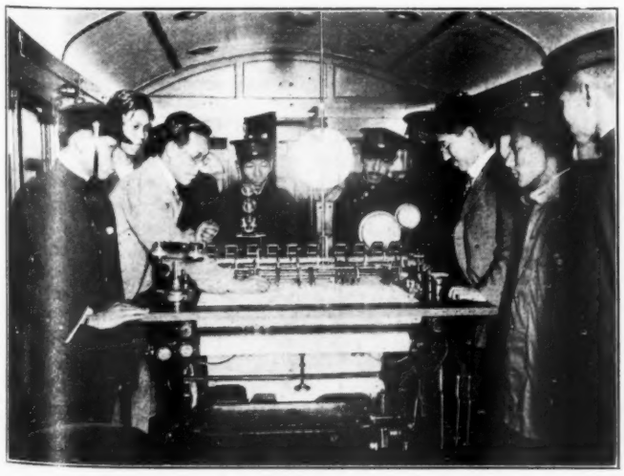
The Northern Pacific will soon file application for permission to reduce rates on through business to the Pacific Coast from St. Paul, Minn., to make it possible to compete with water lines for this business.

The Chicago, Rock Island & Pacific, in conjunction with the Southern Pacific and the El Paso & Southwestern, hauled 10,138 cars of cantaloupes from the Imperial Valley, Cal., up to July 13. The total output from the Imperial Valley this year is estimated at 12,750 cars, of which 10 per cent moves west to Los Angeles and other Pacific Coast points.

All previous records for the number of commercial transits through the Panama Canal and for revenue from tolls for a 15-day period were exceeded during the first 15 days of July when a total of 237 commercial vessels transited the canal with the payment of tolls amounting to $1,071,574.65. The average daily number of commercial transits was 15.8 vessels per day and the average daily tolls, $71,438.30. Since January, when the daily average of transits through the canal was 11.35 vessels, the traffic through the canal has steadily increased until the record mark for the first half of July was reached.

Traffic on the Missouri Pacific during the month of July exceeded all previous records for that month, according to President L. W. Baldwin. The business also surpassed the traffic of any month since October, 1921. During July, 82,682 cars of revenue freight were loaded locally on the road and 30,094 cars were received from connections, making a total of 112,776 cars. This exceeds the figures for the same month of last year by 12,825 cars, or 12.8 per cent. The principal commodities recording increases were lumber and forest products, merchandise, commercial coal, oil and live stock.

The Union Pacific has issued an accurate and attractively printed railway map of the United States. This map is somewhat of a departure from the conventional railway map in that it shows curves where curves exist and the area served by the railway company's lines is not distorted to appear larger proportionately than the rest of the country. The map is printed in colors and on the back are printed many half-tone illustrations of places of interest along the Union Pacific together with descriptive matter.



Kadel & Herbert

Seismometer Used to Test Riding Qualities of Trains in Japan

Commission and Court News

Interstate Commerce Commission

On petition of the American Train Dispatchers' Association the Interstate Commerce Commission has reopened for further hearing its proceeding Ex Parte 72 "in the matter of regulations designating the class of officials that are to be included within the term 'subordinate officials' under Title III of the Transportation Act, 1920," to determine upon the advisability of modifying or supplementing the regulations designating the class of employees that are to be included as subordinate officials. The association asserted in its petition that the Railroad Labor Board had retired assistant chief dispatchers as night chief dispatchers, thus removing them from the classification of subordinate officials as made by the commission and it asked that the commission definitely establish the status.

I. C. C. Closed This Week

The offices of the Interstate Commerce Commission were practically closed this week, except for such force as was considered necessary to attend to business requiring immediate attention, from Tuesday noon until Saturday morning. While the President had ordered the closing of the executive departments during this period, Chairman Meyer of the commission held a conference with the Secretary of State and pointed out that while the commission also desired to comply with the spirit of the order the nature of its work was such that it would be impracticable to close entirely. The heads of divisions were directed to release all employees except those regarded as necessary to keep up with matters that could not be delayed and it was announced that no material would be released to the press during the period mentioned.

State Commissions

The Board of Railway Commissioners of Canada has ordered the Pere Marquette to place in service suitable cars for the transportation of mails between London, Ont., and Walkerville and Blenheim and Sarnia.

Personnel of Commissions

W. S. Dineen, assistant secretary of the Wisconsin Railroad Commission has been appointed secretary, succeeding C. D. Cheverell, resigned.

Court News

Constitutionality of Provision for Payment to Government of ½ Excess of 6 Per Cent Earnings

The federal district court for the Eastern District of Texas holds that section 422 of the Transportation Act requiring all railroads to pay to the Interstate Commerce Commission ½ of the excess earnings over 6 per cent net on the valuation of their properties as fixed by the Commission is constitutional, notwithstanding that the railroad may remain subject to suits by shippers for overcharges made during the income period.—Dayton-Goose Creek Ry. Co. v. United States, 287 Fed. 728.

Engineer's Error of Judgment in Emergency Not Actionable

The Louisiana Supreme Court holds that where, in an emergency, an engineman promptly takes such measures to avoid striking a wagon as then seems best, it is not a fault on his part that he might have erred in judgment, and that the disaster might have been avoided had some other course been followed. Here the engineman, on first seeing a wagon

on a crossing when 150 ft. away, shut off steam and applied the emergency brakes, instead of, as it was urged he should have done, blowing the whistle. He could not do all of these, and if it was an error of judgment, it was held no fault.—Davis v. Alexandria & Western (La.) 94 So. 436.

Confiscation of Shipper's Coal for Railroad's Needs

The Alabama Supreme Court holds that a railroad cannot establish a custom giving it the right to break its contract to deliver a shipment of coal to the consignee by converting the coal whenever it may see fit and paying the consignor the selling price. This, in effect would give the carrier authority to convert the shipment to its own use. If such a custom could govern the shipment of coal, it could be established so as to extend to other commodities. The court also held that the conduct of the consignee in condoning two previous confiscations was not such an authorization as to bind him in this case.

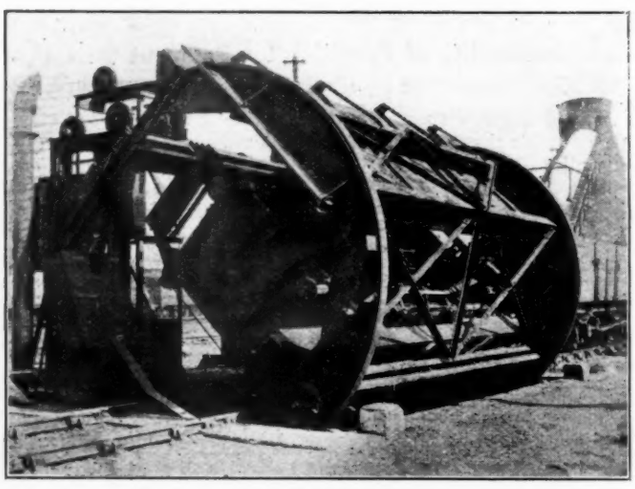
The plaintiff consignee appealed from a judgment in his favor, apparently on the ground that the amount thereof was insufficient. The court said that the plaintiff was not confined as to the amount of recovery to the cost of the coal at the mine, and the judgment was reversed and the cause remanded.—Zimmern v. Southern Ry. Co. (Ala.), 96 So. 226.

Note.—Elliott on Railroads (3rd ed. 1922), §2609, has only this on the subject: "As to whether a railroad company can appropriate shipper's coal on the ground that it is necessary in order to operate its road, see Mobile Ry. v. Zimmern (Ala. 1920), 89 So. 475. This was a case between the same parties arising out of the same facts. It was a suit for injunction against the railroad to restrain it from continuing to appropriate the coal (which the railroad had avowed its purpose to do if occasion should arise), on the ground that the public's interests will suffer thereby." Injunction was allowed.

The court said that the railroad's real contention was that the court by its decree "should set a precedent by which defendant will be informed that the court will not interfere with its practice in general [to appropriate coal on account of shortage]—in effect a license to appropriate the coal of shippers whenever that may be necessary in its judgment, imposing upon shipper the burdensome, if not impossible, task of refuting defendant's assertion that the appropriation of the coal was because of a public necessity."

The court found no case supporting this contention, and mentions only Springfield Light, Heat & Power Co. v. Norfolk & Western, 260. Fed. 264, and not being directly in point but slightly favorable to defendant.

There is, however, a later case, noticed in *Railway Age*, November 11, 1922, page 911, Norfolk & Western v. Ft. Dearborn Coal & Export Co., 280 Fed. 264, in which it was held that where the evidence shows the confiscation was for the railroad's needs and was not malicious, the measure of damages is the market value of the coal at time and place of confiscation, and not its cost to the shipper.



Dumping a Car at Stratford Coaling Station, Great Eastern Railway, England

Foreign Railway News

Canadian Company Secures Big Contract in China

A $20,000,000 contract for the construction of 1,200 miles of railroad in China has been awarded the Northern Construction Company, Winnipeg, Man., according to a report from the Orient. The line will extend from Canton to Chengtu and will pass through mountainous country, necessitating the construction of a number of tunnels.

Contracts Let for South Eastern & Chatham Electrification

Contracts have been awarded to the English Electric Company and the Metropolitan-Vickers Electrical Company, Ltd., respectively for motors and control gear for the electrification of a portion of the suburban lines of the South Eastern & Chatham section of the Southern Railway (England). The contract calls for 508 traction motors each of 300 h.p. The lines to be electrified include all suburban services within a 15-mile radius of Charing Cross, London.

French Plan Railway Across Sahara Desert

France is planning to span the Sahara desert with a railway line with the idea of developing the resources of the region and those of the territories to the south, ultimately joining up with the British railways in the Gold Coast and Nigeria colonies, making a through route from the Mediterranean to the Gulf of Guinea. The French, it is said, plan to have the Sudan ultimately as a cultural and economic entity with their nation. The proposed line would be 1,750 miles in length and the barrenness of the country would present some serious obstacles, among them the provision of water supply and the arrangement of habitable settlements for railway employees.

Japan Imports American Ties

Tokio.

The Department of Railways of Japan has just imported 35,000 American cedar cross-ties through a Kobe firm. This is the first attempt ever made to use American cedar as ties in Japan. The Japanese State Railways use roughly 3,500,000 ties annually. Thus far preference has been given to chestnut, Japanese oak and a few other similar woods. Although Oregon pine has been used occasionally it has formed no large percentage of the whole lots used on the state lines. American cedar was tried some years ago but was not actually used because it was found too expensive. The new importation of American cedar has been made now on account of the discovery that American cedar is more durable than chestnut or Oregon pine. It is believed that the importation of American cedar can get a wider market in this country if the price is made to stay around the present level.

THIS SPRING the agricultural agent of the American Railway Association bought some northwest coast apples from retailers in New York City and paid from 10 to 15 cents each for them. He found on investigation that the grower received about 1 cent each for that quality of apples. The freight from the shipping point to New York was a cent and a quarter, and the cost of distribution in the city by truck about the same. With a reasonable wholesalers' profit added, the cost of such apples to the retailer should be about 5 cents each. The railways present this instance as proving the injustice of the complaint that high prices are due to high freight rates—and in a wide range of articles, perhaps in all, the railways are right. If the apples in question had been carried free from Washington or Oregon to New York the consumer never would have known the difference. Somebody would have "taken up the slack," whether wholesaler or retailer the agent who made the investigation does not indicate.—*Daily Journal (Chicago)*.

Equipment and Supplies

Locomotives

THE RICHMOND, FREDERICKSBURG & POTOMAC contemplates buying two Mountain type locomotives and two Pacific type locomotives.

Freight Cars

THE UNION PACIFIC contemplates buying 250 tank cars.

THE ROXANNA PETROLEUM COMPANY, St. Louis, Mo., is inquiring for 350 tank cars.

THE LAKE SUPERIOR & ISHPEMING is inquiring for 200 steel ore cars of from 50 to 75 tons' capacity.

THE CHICAGO & NORTH WESTERN has ordered 50 center constructions for freight cars from the Western Steel Car & Foundry Company.

THE WABASH, reported in the *Railway Age* of August 4, as inquiring for 150 steel underframes for box cars, has ordered 75 steel underframes for freight cars from the American Car & Foundry Company.

Passenger Cars

THE UNION SOUTH AFRICA is inquiring for one underframe dynamometer car.

THE ERIE contemplates buying 6 all steel through line coaches and 38 all steel suburban coaches.

THE NEW YORK CENTRAL is making repairs to 10 coaches in the Collinwood, Ohio, shops The improvements include putting steel underframes on these coaches.

THE MISSOURI PACIFIC, reported in the *Railway Age* of July 14, as inquiring for 60 cars for passenger service, has ordered 18 coaches, 12 chair cars and 10 baggage cars from the American Car & Foundry Company, and 9 divided coaches, 3 cafe club cars and 8 dining cars from the Pullman Company.

Iron and Steel

THE BALTIMORE & OHIO is inquiring for 350 tons of steel for bridges.

THE CHICAGO, ROCK ISLAND & PACIFIC is inquiring for 650 tons of structural steel for use at Eldon, Iowa.

THE CHICAGO, BURLINGTON & QUINCY is inquiring for 1,300 to 2,000 tons of plates, shapes and bars for car repairs to be applied in its own shops.

Machinery and Tools

THE CANADIAN NATIONAL is inquiring for about 20 machine shop tools.

THE CHICAGO, BURLINGTON & QUINCY has ordered one 20-ton locomotive crane from the Browning Company.

Signaling

THE SOUTHERN PACIFIC will install an interlocking plant at the junction in Redwood City, Cal., at a cost of approximately $36,000.

Supply Trade News

The Union Railway Equipment Company has discontinued its Montreal office and will handle Canadian business through its general office at Chicago.

D. T. Harris, who has been associated with the sales department of the American Steel Foundries since 1904, died in Rochester, Minn., on July 25.

John R. Hayward has been appointed southern representative of the **Davis Brake Beam Company,** Johnstown, Pa. Mr. Hayward's headquarters are in the First National Bank building, Roanoke, Va.

A. N. Willsie has been appointed western sales manager of the **Locomotive Stoker Company,** with headquarters in Chicago, to fill the position recently vacated by A. C. Deverell, who has resigned to go into business for himself. Mr. Willsie started his railroad experience in the master mechanic's office on the Chicago, Burlington & Quincy in April, 1880. He worked in various capacities with the Burlington for 39 years, serving consecutively in the offices of the timekeeper, locomotive shops, car shops, and later became locomotive fireman and locomotive engineman and road foreman of engines. He was then division master mechanic, also division superintendent and for a number of years filled the position of supervisor of fuel economy at the general office in Chicago until he entered the service of the Locomotive Stoker Company as district engineer, which position he held up to the time of his appointment as western sales manager as above noted.

A. N. Willsie

J. M. Marshall, assistant to district engineer at New York, of the **Portland Cement Association,** Chicago, has been appointed district engineer of the office at Atlanta, Ga., succeeding Walter B. Elcock, promoted.

The American Brake Shoe & Foundry Company, New York, has purchased a four acre site in North Kansas City, Mo., where it will manufacture brake shoes and iron castings. The construction of the building will be started at once and it is hoped to have it completed by fall.

The Texas Creosoting Company of Orange, Tex., has been organized by **R. S. Manley** and associates. It is planned to begin immediately the construction of a creosoting plant, which will be located on tide water to facilitate the handling of export business over the company's wharf.

C. S. Chadwick, vice-president and general manager of the **Eppinger & Russell Company, New York,** has been elected president succeeding A. D. Fletcher, deceased, and will be succeeded by **H. S. Valentine,** assistant secretary and treasurer, who will be succeeded by **E. E. Ter Meer.**

The railway sales department of the **French Battery & Carbon Company,** which was recently established in temporary headquarters at New York, has been moved to 11 South Desplaines street, Chicago, where it will be permanently located. **W. S. Marvin,** manager of railway sales, is in charge of the new office.

Major Walter Gresham Andrews, of the sales department of **Pratt & Lambert, Inc.,** Buffalo, N. Y., has been elected a member of the board of directors. **Harold E. Webster,** purchasing agent, has been appointed secretary and **Walter P. Werheim,** advertising manager, has been made a director of the company.

Phillip X. Rice, instructor in railway electrical engineering and research engineer at the Pennsylvania State College, has been appointed electrical engineer of the **Miller Train Control Corporation,** with headquarters at Danville, Ill. Mr. Rice was born in 1892 at Bentonville, Ark., and was graduated from the University of Arkansas in 1916. In 1913 he became associated with the General Railway Signal Company. During the war he was attached to the British Light Railway Forces and also the general headquarters of the American army and was later made chief engineer of power plant construction and operation. In 1921 he became instructor in railway electrical engineering and an engineer in refrigerator car research at Pennsylvania State College, which position he held until his recent appointment.

Phillip X. Rice

J. P. Moses has been appointed general manager of railroad sales for **Joseph T. Ryerson & Son, Inc.,** with headquarters in the Illinois Merchants Bank building, Chicago. **H. T. Bradley** has been appointed manager of eastern railroad sales with headquarters at 30 Church street, New York City. **H. A. Gray,** formerly manager of railroad sales, has resigned to enter another field of business.

The Central Brake Shoe & Foundry Company, Chicago, has opened a sales office in that city at 247 Railway Exchange. The officers of the company are **F. Van Inwagen,** president; **A. C. Deverell,** vice-president and **R. E. Frame,** vice-president. Mr. Van Inwagen has been connected with the Corn Exchange Bank of Chicago and prior to that time was in the manufacturing business. Mr. Deverell was formerly general superintendent of motive power of the Great Northern and more recently western sales manager of the Locomotive Stoker Company at Chicago. Mr. Frame has been sales agent for the Pullman Company and was formerly manager of sales for the Haskell & Barker Car Company, Michigan City, Ind. The company's plant is located at Clearing, Ill.

Stanley H. Smith, who represented the Pennsylvania Steel Company and the Bethlehem Steel Company in Cleveland and Chicago, and since leaving the latter company has been acting as a manufacturers' agent at 422 Frankfort avenue, Cleveland, Ohio, has been appointed district representative for Ohio for the **Titusville Forge Company** of Titusville, Pa. Mr. Smith represents the Wyoming Shovel Works, the National Lock Washer Company, Harrisburg Pipe & Pipe Bending Co., and the Stevens Metal Products Company.

George F. Murphy, having completed the reorganization of the New York office of the **Heine Boiler Company,** St. Louis, Mo., has taken charge of the Philadelphia territory with headquarters in the Pennsylvania building, Philadelphia, Pa.; **Harold P. Childs,** formerly special representative of the executive offices of the General Electric Company, New York, has been appointed manager of the New York City office of the Heine Boiler Company with headquarters at 11 Broadway; **J. R. Fortune,** formerly manager of the Detroit office, has assumed charge of the territories heretofore covered by the Pittsburg, Cleveland and Detroit offices, with headquarters in the Dime Bank building, Detroit, and in the Park building, Pittsburg. The Cleveland, Ohio, office has been discontinued.

Obituary

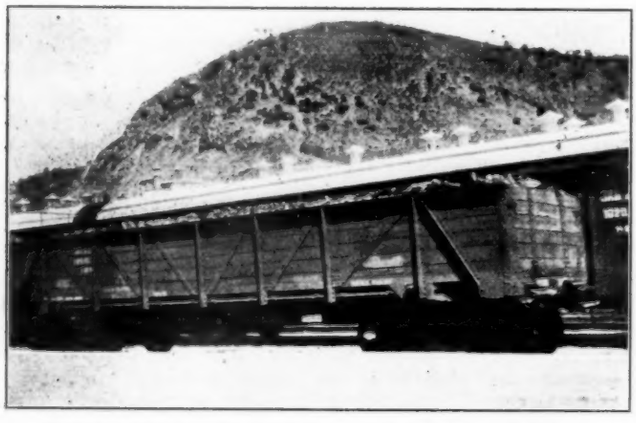
Charles E. Meyer, formerly secretary and treasurer of the Bagnell Timber Company, St. Louis, Mo., died on August 4 at his home in that city.

Trade Publications

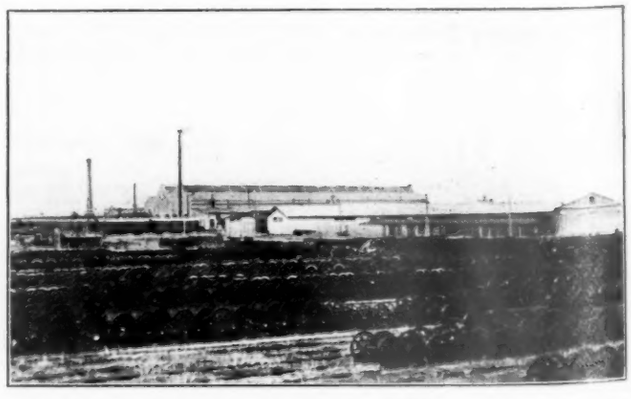
ZINC ROOFING.—The New Jersey Zinc Company, New York, has issued a small leaflet outlining the adaptability of standing-seam Horse Head zinc roofing for many types of buildings. The leaflet is illustrated with sketches showing how the roofing is applied.

UPKEEP RECORDS.—The Erie Steam Shovel Company, Erie, Pa., has issued a 72-page booklet containing reports on the cost of upkeep of Erie steam shovels as used in a wide variety of conditions and service requirements. These reports were obtained through a contest conducted by the shovel company for the purpose of gathering this information. In addition to the individual reports, the booklet contains summarized conclusions based on an analysis of the information presented.

MIXING COAL.—In a 12-page illustrated bulletin, the Roberts & Schaefer Company, Chicago, present a number of excellent photographs and a description of the South Junction coaling station of the Delaware & Hudson, which was designed to mix anthracite and bituminous coal in delivering this coal from the track hoppers to the storage bin and described in the *Railway Age* of June 23, page 1533. Illustrations and brief descriptions are also given of other coaling stations recently built by this company on various railroads.



An American-Built Coal Car on the Chinese Eastern



Discarded Wheels and Axles at Chinese Eastern Shops, Harbin, Manchuria

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company contemplates the construction of a new freight terminal in the northern part of San Diego, Cal.

BALTIMORE & OHIO.—This company, jointly with the Chicago, Burlington & Quincy, has purchased 200 acres of land near Washington Park, East St. Louis, Ill., and is now calling for bids for the construction of new yard tracks on the property which it has purchased.

BALTIMORE & OHIO.—This company has awarded contracts to the Seaboard Construction Company, Philadelphia, Pa., covering the erection of three bridges on its main line, Cumberland division, and six on the main line, Wheeling division, between Fairmont and Benwood, W. Va. The new structures consist of plate girder spans, ranging in length from 45 to 95 ft. The total weight of steelwork involved is approximately 1,100 tons.

BEAVER, MEADE & ENGLEWOOD.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an extension from Forgan to Hooker, Okla., 39.2 miles, with a view to an eventual further extension to Des Moines, N. M.

CANADIAN PACIFIC.—This company will close bids on August 14 for the construction of a new steamship terminal building at Victoria, B. C., reported in the *Railway Age* of February 3. The building will be four stories in height and will cost approximately $150,000.

CHICAGO, BURLINGTON & QUINCY.—This company closed bids on August 8 for the construction of a passenger station at Lamont, Iowa.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has awarded a contract to the Peterson, Shirley & Gunther Company, Omaha, Neb., and Roberts Bros., Chicago, for the grading incident to the construction of 23 mi. of second track on its Terre Haute, Ind., line between Tallmadge, Ill., and Webster, and for 13½ mi. of second track from West Dana, Ind., to Bradshaw. The ballasting, track laying and surfacing for the project will be done with company forces.

CHICAGO & NORTH WESTERN.—This company has awarded a contract to the T. S. Leake Construction Company, Chicago, for the construction of a 22 ft. by 80 ft. passenger station and for the construction of a 72 ft. by 50 ft. freight station at Eagle River, Wisconsin.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has authorized the construction of the following new facilities and betterments: A new passenger station at Iowa Falls, Iowa, and additions to the passenger station, platform and canopy at El Dorado, Ark.; new water treating plants at Cedar Rapids, Iowa; Albert Lea, Minn.; Faribault and Owatonna, Minn.; Fairbury, Neb.; Scandia, Kan., and Willard; a 400-ton coaling station and cinder pit at Rock Island, Ill., a 200-ton coaling station and cinder pit at Council Bluffs, Iowa, a 400-ton coaling station at Eldon, Iowa, and a 300-ton coaling station at Dalhart, Tex.; extension of four roundhouse stalls, replacing of a cinder pit and building a drop pit at Haileyville, Okla.; the construction of four new stalls and the extension of 13 stalls in the roundhouse at Shawnee, Okla.

HOUSTON NAVIGATION & CANAL COMMISSION.—This board has contracted for 1,080 lots of the Houston Harbor Addition for the construction of a railroad classification yard to facilitate traffic through the Port of Houston. About $120,000 was paid for the lots. The proposed classification yard, in line with the general improvement of the port, will accommodate about 4,000 freight cars in storage, as well as providing trackage for the prompt distribution of cars assigned to the several wharves, and for the making up of trains from cars which will be loaded at the wharves.

LAKE ERIE & WESTERN.—This company has authorized the construction of improvements and additions to its shops at Lima, Ohio, at a cost of approximately $150,000. When the new facilities are completed, the Lima shops will constitute the largest repair shops on the consolidated Nickel Plate system.

LAUREL FORK & MENDOTA.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line from a point near North Holston, Va., to a connection with the Carolina, Clinchfield & Ohio at Kingsport, Tenn. John M. Kreger, of Abingdon, Va., is president of the company.

LONGVIEW, PORTLAND & NORTHERN.—This company contemplates the construction of a new line approximately 30 mi. long from near Kelso, Wash., to Olequa. The cost of the project is estimated at approximately $3,000,000.

MOFFAT TUNNEL.—The Moffat Tunnel Commission will receive bids until August 25 for the boring of a main tunnel 16 ft. by 24 ft. and a pioneer tunnel 8 ft. by 8 ft. under the James Peak in Brand County, Colo. The tunnels will be approximately 6 miles long.

NATIONAL RAILWAYS OF MEXICO.—This company has awarded a contract to the Pioneer Transfer Company, Calexico, Cal., for the grading of the first 34 miles of new line from Mexicali to the Gulf of California, which was reported in the *Railway Age* of June 16. The cost of the first section will be approximately $338,000.

OREGON SHORT LINE.—Construction of a 2½-mile extension between Nampa, Idaho, and the Boise branch of this company, has been approved by the Interstate Commerce Commission. The extension is necessary in order that main line trains from Boise may run through Nampa without switching and because of the changing of the Boise branch to main line.

PERE MARQUETTE.—This company has awarded a contract to the Arnold Company, Chicago, for the construction of a 16-stall brick roundhouse and the installation of a 100-ft. turntable at Erie, Mich. This project was reported in the *Railway Age* in the issue of May 12.

NEW YORK CENTRAL.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line of 2.1 miles from a connection with its main line near Depew, N. Y., to a connection with the West Shore near Bowmansville.

ROCKDALE, SANDOW & SOUTHERN.—This company has applied to the Interstate Commerce Commission for authority to complete the construction and operate a line from a connection with the International-Great Northern at Marjorie to Sandow, Texas, a distance of 6½ miles, for the purpose of opening up lignite, timber and agricultural territory.

ST. LOUIS SOUTHWESTERN.—This company is constructing a new steel viaduct, 90 ft. long, across its tracks at Stephens, Ark., to cost approximately $25,000.

STALEY SYSTEM OF ELECTRIFIED RAILWAY.—The Southern Pacific has filed with the Interstate Commerce Commission a brief protesting against the issuance of a certificate of public convenience and necessity asked by W. L. Staley to authorize the construction of an extensive system of electric railway in Arizona, New Mexico and California for which the promoters claimed that some $40,000,000 of stock had been subscribed. The Southern Pacific said that the territory is already adequately served, that the promoter does not propose to invest any money of his own, that no authentic information had been furnished to the commission showing that the traffic or revenues of any such railroad would warrant its construction, that 90 per cent of the estimated earnings represent estimated new business and that authentic engineering data is lacking.

TEMISKAMING & NORTHERN ONTARIO.—This company has awarded a contract to the R. A. and I. A. Sinclair Company, Toronto, Ont., for the construction of a 25 mi. branch line which is to extend from Swastika, Ontario, eastward to Kirkland, Ontario.

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ATCHISON, TOPEKA & SANTA FE.—*Lease of Osage County & Santa Fe.*—Acquisition by this company of control of the Osage County & Santa Fe Railway under a 10-year lease has been authorized by the Interstate Commerce Commission. The leased line extends from a connection with the Santa Fe at Owen, Okla., a distance of 35 miles to Pawhuska. The Santa Fe owns the entire capital stock of the leased line.

CAROLINA, CLINCHFIELD & OHIO.—*Hearing on Proposed Lease.*—The Interstate Commerce Commission has set for hearing at Washington on September 10 before Director Mahaffie of its bureau of finance the joint application of the Atlantic Coast Line and the Louisville & Nashville for authority to acquire control of the property of this company by lease.

CENTRAL OF NEW JERSEY.—*Sale of Coal Stock Approved.*—The United States District Court at Philadelphia approved on August 8 the sale under the Reading dissolution plan of the Lehigh & Wilkes-Barre coal stock to the Reynolds Syndicate of New York, at the original price of $32,190,980.

In approving the sale, the court dismissed objections of minority stockholders, in the Central of New Jersey, who alleged that the sale had not been made in good faith. The court ruled that the objectors had failed to prove their contention and ordered the sale of the 69 000 shares of the coal company holdings as provided in the dissolution plan.

DENVER & RIO GRANDE WESTERN.—*Reorganization.*—To effect reorganization this company has applied to the Interstate Commerce Commission for authority to issue at par $29,808,000 of 5 per cent general mortgage bonds; and $16,445,600 of six per cent preferred stock. Assumption by the applicant of the following underlying bonds and obligations constituting liens on the property also was proposed:

$34,125,000 of Denver & Rio Grande Railroad first consolidated mortgage 4 per cent gold bonds, maturing January 1, 1936;

$6,382,000 of Denver & Rio Grande Railroad first consolidated mortgage 4½ per cent gold bonds, maturing January 1, 1936;

$8,335,000 of Denver & Rio Grande Railroad improvement mortgage 5 per cent gold bonds, maturing June 1, 1928;

$15,190,000 of Rio Grande Western Railway first trust mortgage 4 per cent 50-year gold bonds maturing July 1, 1939;

$15,080,000 of Rio Grande Western Railway first consolidated mortgage 4 per cent 50-year gold bonds maturing April 1, 1949;

$2,000,000 of Rio Grande Junction Railway first mortgage 5 per cent 50-year gold bonds, maturing December 1, 1939; and

Obligations of the receiver of the Denver & Rio Grande Western Railroad of $4,500,000 of Denver & Rio Grande Western Railroad equipment trust certificates maturing in equal annual installments of $300,000 on March 1 from 1924 to 1938, issued March 1, 1923.

The applicant also sought authority to acquire 19,583 shares of the capital stock of the Rio Grande Junction Railway, the amount outstanding being 20,000 shares at $100 par, and 1,492 shares of the Rio Grande & Southwestern Railroad, 1,500 now outstanding at $100 par.

The securities will be issued in respect of the acquisition by the applicant of the railroad properties subject to the refunding and adjustment mortgages, and other properties, interests and cash which are to be acquired by the applicant pursuant to the reorganization plan. These properties will be acquired free from the respective liens of such mortgages.

The carrying out of the reorganization plan and the issue of securities under its provisions will terminate the receivership of the applicant and free such properties from the control and operation of the court, the applicant represented. Part of the funded debt resting upon its properties will be converted into preferred stock, the applicant stated, thus considerably reducing fixed charges. Under the reorganization plan new capital will be paid into the applicant's treasury which will be applicable to the retirement of $5,000,000 of receiver's certificates heretofore issued and sold to provide necessary funds for the making of betterments and additions, for additional capital expenditures and other purposes of the reorganization.

The plan provides for the creation of an issue of refunding and improvement bonds to be secured by mortgage prior in lien to all other securities to be issued under the plan. Such bonds are not to be issued at present but are to be reserved for the purpose of refunding underlying bonds, making betterments, improvements and extensions, and acquiring certain new properties and equipment.

DETROIT, BAY CITY & WESTERN.—*Asks Authority to Discontinue Operation.*—The receiver has applied to the Interstate Commerce Commission for authority to discontinue the operation of this line from Bay City to Port Huron, Mich.

LEHIGH VALLEY.—*With Reading to Purchase Thomas Iron Company.*—This company and the Reading company has filed a joint application with the Interstate Commerce Commission to purchase from the Thomas Iron Company equal shares of the entire capital stock of the Ironton Railroad, consisting of 16,000 shares of $50 each. The Ironton Railroad extends from Hokendauqua to Siegersville, Pa., with branches to Coplay and Ironton, a total of 12 miles of line. It connects with the Lehigh at Coplay and Hokendauqua and with the Lehigh and with the Reading system at Catasauqua.

MINNESOTA TRANSFER.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $279,000 of first mortgage 5 per cent bonds to be delivered to its stockholders to apply on amounts advanced by them for construction and equipment.

MUSCATINE, BURLINGTON & SOUTHERN.—*Asks Authority to Abandon Line.*—The receiver has applied to the Interstate Commerce Commission for authority to abandon the entire line of this company which extends from Muscatine to Burlington, Ia., a distance of 47.8 miles.

PERE MARQUETTE.—*Acquires Interest in Belt Railway of Chicago.*—Directors of the Belt Railway of Chicago have approved the sale of 2,400 shares of Belt Railway stock to the Pere Marquette by means of which purchase the Pere Marquette acquires an equal interest with 12 other roads in the Belt Railway property.

PERE MARQUETTE.—*To Purchase Interest in Belt Railway of Chicago.*—The directors of the Belt Railway of Chicago have approved the sale of 2,400 shares of the carrier's stock at $100 a share to the Pere Marquette Railway Company. This transaction will make the Pere Marquette an equal owner of the Belt Railway with the other twelve roads already part owners of the Belt Line. Approval of the action by the Interstate Commerce Commission is now being asked.

WABASH.—*Equipment Trust Certificates Authorized.*—The Interstate Commerce Commission has authorized the issue of $2,010,000 of 5½ per cent equipment trust certificates, to be sold at 97.02 to Kuhn, Loeb & Co.

WYOMING & MISSOURI RIVER.—*Authorized to Issue Stock.*—This company has been authorized by the Interstate Commerce Commission to issue $50,000 in capital stock at $100 par.

Treasury Payments to Railroads

Since last announcement, dated July 2, 1923, payments under Sections 204, 209, 210 and 212 of the Transportation Act, 1920, as amended, have been made by the Treasury as follows:

Section 204:	
Alcolu Railroad Company	$3,265.11
Boyne City, Gaylord & Alpena R. R. Co.	29,312.36
Great Western Railway Co.	65,152.98
Louisiana & Pacific Railway Co.	30,747.95
Orangeburg Railway Co., Receiver	4,772.17
Savannah & Statesboro Railway Co.	18,112.75
Waukegan, Rockford & Elgin Traction Co., Receiver	246.87
Wisconsin Northwestern Railway Co.	10,847.39
Section 209:	
Adirondack & St. Lawrence Railroad Co.	5,750.78
Coudersport & Port Allegany Railroad Co.	3,811.18

Montana, Wyoming & Southern Railroad Co.		14,090.19
Raquette Lake Railway Co.		14,715.60
Union Railway Company		255,545.06
Union Stock Yards Co. of Omaha (Ltd.)		4,780.81
Waycross & Southern Railroad Co.		4,577.72
Section 210		.....
Section 212		.....
Total		$465,728.82
Total payments to July 31, 1923:		
(a) Under Section 204, as amended by Section 212 for reimbursement of deficits during federal control:		
(1) Final payments, including partial payments previously made	$7,365,811.65	
(2) Partial payments to carriers as to which a certificate for final payments has not been received by the Treasury from the Interstate Commerce Commission	694,837.44	
Total payments, account reimbursement of deficits		8,060,649.09
(b) Under Section 209, as amended by Section 212 for guaranty in respect to railway operating income for first six months after federal control:		
(1) Final payments, including advances and partial payments previously made	$206,266,802.48	
(2) Advances to carriers as to which a certificate for final payment has not been received by the Treasury from the Interstate Commerce Commission	183,505,093.00	
(3) Partial payments to carriers as to which a certificate for final payment has not been received, as stated above	89,132,922.09	
Total payments, account of said guaranty		478,904,817.57
(c) Under Section 210, for loans from the revolving fund of $300,000,000 therein provided		337,629,667.00
Total		$824,595,133.66

Trend of Railway Stock and Bond Prices

	August 7	Last Week	Last Year
Average price of 20 representative railway stocks	58.89	57.80	70.72
Average price of 20 representative railway bonds	82.18	82.23	88.95

An Anti-waste Drive, throughout all departments in all sections of the country has been started by the Pullman Company. An investigation has disclosed waste in the cleaning and upkeep of cars. If each of the 4,000 cleaners misuses a pound of waste a week, the loss is $25,000 a year and the saving of a bar of soap a week by each employee would amount to $12,500 a year. It was found that there was issued a new sheet and a new towel for every 24 passengers carried last year and that every passenger represented approximately five cents expenditure for supplies or an average of $240 a car. The efficiency plan has been carried into the shops also.

A System Appeal Board, which will consider discipline, wages, interpretations of agreements, and the drafting and negotiation of new or amended agreements and other matters relative to labor, has been formed by the Kansas City Southern and its affiliated lines, the Texarkana & Ft. Smith, the Arkansas Western and the Poteau Valley. The members of the board are the auditor, the general superintendent of transportation, the superintendent of machinery, the chief engineer and the superintendents of the Kansas City terminal, the Northern and the Southern divisions. The superintendent of personnel of the Kansas City Southern will act as chairman and the supervisor of wages and working agreements, as secretary of the board. Monthly meetings of the board will be held at Kansas City, Mo. Discipline cases can be settled only by the unanimous vote of all the members present at meeting, but other matters within the jurisdiction of the board require only a three-fourths vote.

Railway Officers

Executive

Norman S. Buckingham has been appointed assistant to the vice-president of the New York, New Haven & Hartford, reporting to the vice-president and general counsel, with headquarters at New Haven, Conn. **James W. Carpenter,** attorney, has been appointed counsel succeeding Mr. Buckingham. He will continue to perform the duties of attorney, reporting as to such duties to the general attorney, and to the general solicitor as to his duties as counsel.

Financial, Legal and Accounting

J. N. McNeill has been appointed auditor of the Macon, Dublin & Savannah, with headquarters at Macon, Ga.

Operating

A. J. McCarthy has been appointed chief train dispatcher of the Kankakee line of the New York Central, with headquarters at Kankakee, Ill., succeeding **T. H. Malone,** retired on pension at the age of 70 years.

J. J. Hayden has been appointed to the manager, refrigerator department of the Car Service division, American Railway Association, with headquarters at Chicago, succeeding O. P. Nelson, who has resigned.

E. B. Kessler has been appointed assistant superintendent of the Long Island, succeeding **Ralph Peters, Jr.,** promoted. **O. V. Good** has been appointed freight trainmaster and **H. B. Winship** has been appointed assistant freight trainmaster.

Joel H. Curtis has been appointed superintendent of the Northern division of the Bangor & Aroostook, with headquarters at Houlton, Maine, succeeding J. P. Darling, resigned. **Henry H. Dow,** assistant trainmaster of the Northern division, has been appointed trainmaster, and **Harry G. Johnson** has been appointed assistant trainmaster.

J. J. Sullivan, terminal trainmaster of the Southern Pacific at Los Angeles, Cal., has been transferred to the Shasta division, with headquarters at Dunsmuir, Cal., succeeding **E. J. Kellum,** who has been transferred to Los Angeles, Cal. Mr. Kellum succeeds **G. E. Donnatin,** who has been appointed terminal trainmaster at Los Angeles, succeeding Mr. Sullivan.

The Canadian National lines in Michigan, Indiana and Illinois, have been separated from that road's Central Region and will hereafter be designated as the Grand Trunk Western for operating purposes. **H. E. Whittenberger,** at present manager of the Michigan district, has been appointed general manager of the Grand Trunk Western, with headquarters at Detroit, Mich.

W. L. Booth, whose appointment as chief of yard and terminal operations of the Chesapeake & Ohio was announced in the *Railway Age* of August 4, page 229, was born on October 17, 1880, at Richmond, Va., and was educated at the University of Richmond. In 1897 he entered the service of the Chesapeake & Ohio as a clerk and held various clerical positions with that company until 1910, when he was promoted to assistant trainmaster of the Cincinnati division. The following year he was promoted to assistant superintendent of the same division and shortly thereafter to superintendent of the Ashland and Big Sandy divisions. From 1913 to 1916 he was superintendent of the Chesapeake & Ohio of Indiana. He then became superintendent of freight transportation and in the following year was promoted to general superintendent of transportation and assistant general manager. In 1918 he was appointed superintendent of transportation and held that position until the time of his recent promotion.

Traffic

C. T. Chapman has been appointed general agent for the Wabash, with headquarters at Peoria, Ill.

H. P. Gardner, southwestern passenger agent for the Wabash, with headquarters at Dallas, Tex., has been given the title of district passenger agent, with the same headquarters.

C. K. Landes, assistant general freight agent of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn., has been transferred to St. Paul, Minn. The report that Mr. Landes had been promoted to general freight agent at Minneapolis, which appeared in the *Railway Age* of July 28, was incorrect.

A. R. Atkinson, assistant general freight and passenger agent of the Southern Pacific, Texas lines, with headquarters at Dallas, Texas, has been promoted to assistant general freight agent in charge of rates, with headquarters at Houston, Tex., succeeding L. F. Daspit, resigned. **H. J. Fitzgerald,** division freight and passenger agent, with headquarters at Ft. Worth, Tex., has been promoted to assistant general freight and passenger agent, with headquarters at Dallas, succeeding Mr. Atkinson. **C. S. Elliot,** division freight and passenger agent, with headquarters at Waco, Tex., has been transferred to Ft. Worth, succeeding Mr. Fitzgerald. **T. G. Ratcliff** has been appointed division freight and passenger agent, with headquarters at Waco, succeeding Mr. Elliot. **W. J. Carter** has been appointed division freight and passenger agent, with headquarters at Galveston, succeeding **A. J. Morriss,** who has been promoted to general agent, freight department, with headquarters at Houston, Tex.

F. S. McGinnis, general passenger agent for the Southern Pacific, with headquarters at Los Angeles, Cal., has been promoted to assistant passenger traffic manager, with the same headquarters. **J. T. Sounders,** general freight agent, with headquarters at Los Angeles, has been promoted to assistant freight traffic manager, with the same headquarters. **F. E. Watson,** assistant general passenger agent, with headquarters at Los Angeles, has been promoted to general passenger agent, with the same headquarters, succeeding Mr. McGinnis. **F. E. Scott,** assistant to the director of traffic, with headquarters at New York, has been promoted to general freight agent, with headquarters at Los Angeles, succeeding Mr. Saunders. **A. A. Johnson,** chief clerk in the general freight department at San Francisco, Cal., has been promoted to assistant general freight agent, with headquarters at the same place. **R. B. Houston,** traveling agent, with headquarters at Santa Rosa, Cal., has been promoted to district freight and passenger agent, with the same headquarters. **J. H. McClure,** freight agent at Tucson, Ariz., has been promoted to assistant district freight and passenger agent, with headquarters at Santa Barbara, Cal.

H. A. Cochran, for the past three years and a half assistant coal traffic manager of the Baltimore & Ohio, at Baltimore, has been appointed coal traffic manager to succeed the late H. M. Matthews. Mr. Cochran was born at Clarinda, Iowa, on January 14, 1871. After his early education in the district and high schools of New California, O., he taught in a district school from 1889 to 1891 and in the latter year entered business college at Delaware, O. His first railroad service was with the Cleveland, Cincinnati, Chicago & St. Louis, in 1892, as stenographer and in that capacity he first became identified with the Baltimore & Ohio in the office of the commercial freight agent, at Wheeling, W. Va., in April, 1897. A few months later he was transferred to the general freight office at Pittsburgh and in March, 1898, was made chief clerk to the coal and coke agent there. Mr. Cochran became assistant coal and coke agent at Cleveland, O., in January, 1905, remaining in that position until September, 1911, when he was promoted to coal freight agent at Baltimore and to general coal freight agent in 1916. In 1918, he went with the United States Fuel Administration and after the war returned to the Baltimore & Ohio as assistant coal traffic manager.

Engineering, Maintenance of Way and Signaling

R. W. E. Bowler, supervisor on the Pennsylvania, with headquarters at Washington, D. C., has been promoted to division engineer of the Toledo division, with headquarters at Toledo, Ohio, succeeding **W. R. Hillary,** transferred.

Obituary

Edward C. Lalonde, senior inspector for the board of Railway Commissioners of Canada, died suddenly at Moncton, N. B., on August 1.

Joseph A. Jordan, president of the Green Bay & Western, with headquarters at Green Bay, Wis., died in that city on August 1. Mr. Jordan was 74 years old at the time of his death and had been president of the Green Bay & Western for 10 years.

Ewing Galloway

Victoria Station, Bombay, India